

CHAPTER 3B. PAVEMENT AND CURB MARKINGS

Section 3B.01 Yellow Centerline Pavement Markings and Warrants

Standard:

Centerline pavement markings, when used, shall be the pavement markings used to delineate the separation of traffic lanes that have opposite directions of travel on a roadway and shall be yellow.

Option:

Centerline pavement markings may be placed at a location that is not the geometric center of the roadway.

On roadways without continuous centerline pavement markings, short sections may be marked with centerline pavement markings to control the position of traffic at specific locations, such as around curves, over hills, on approaches to highway-railroad grade crossings, at highway-railroad grade crossings, and at bridges.

Standard:

The centerline markings on two-lane, two-way roadways shall be one of the following as shown in Figure 3B-1:

- A. Two-direction passing zone markings consisting of a normal broken yellow line where crossing the centerline markings for passing with care is permitted for traffic traveling in either direction;
- B. One-direction no-passing zone markings consisting of a normal broken yellow line and a normal solid yellow line where crossing the centerline markings for passing with care is permitted for the traffic traveling adjacent to the broken line, but is prohibited for traffic traveling adjacent to the solid line; and
- C. Two-direction no-passing zone markings consisting of two normal solid yellow lines where crossing the centerline markings for passing is prohibited for traffic traveling in either direction.

The centerline markings on undivided two-way roadways with four or more lanes for moving motor vehicle traffic always available shall be the two-direction no-passing zone markings consisting of two normal solid yellow lines as shown in Figure 3B-2.

Raised pavement markers (RPM), when added to centerlines, shall conform to Figure 3B-2a (see Section 3B.11). Additional Raised pavement markers Guidelines can be obtained from the Maryland State Highway Administration's Office of Traffic & Safety, Traffic Engineering Design Division (TEDD) at the address shown on Page i.



Guidance:

On two-way roadways with three through lanes for moving motor vehicle traffic, two lanes should be designated for traffic in one direction by using one- or two-direction no-passing zone markings as shown in Figure 3B-3.

Standard:

Centerline markings shall be placed on all paved urban arterials and collectors that have a traveled way of 6.1 m (20 ft) or more in width and an ADT of 6,000 vehicles per day or greater. Centerline markings shall also be placed on all paved two-way streets or highways that have three or more lanes for moving motor vehicle traffic.

Guidance:

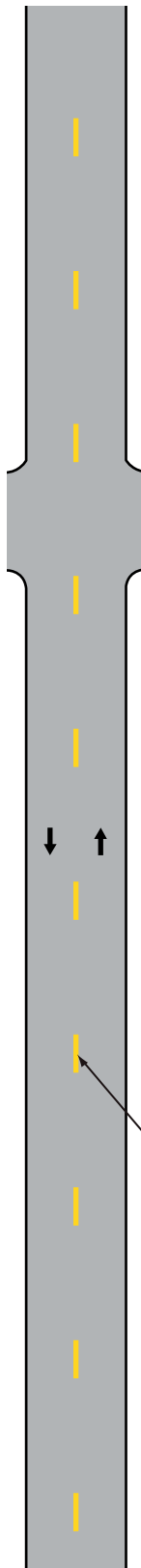
Centerline markings should be placed on paved urban arterials and collectors that have a traveled way of 6.1 m (20 ft) or more in width and an ADT of 4,000 vehicles per day or greater. Centerline markings should also be placed on all rural arterials and collectors that have a traveled way of 5.5 m (18 ft) or more in width and an ADT of 3,000 vehicles per day or greater. Centerline markings should also be placed on other traveled ways where an engineering study indicates such a need.

Engineering judgment should be used in determining whether to place centerline markings on traveled ways that are less than 4.9 m (16 ft) wide because of the potential for traffic encroaching on the pavement edges, traffic being affected by parked vehicles, and traffic encroaching into the opposing traffic lane.

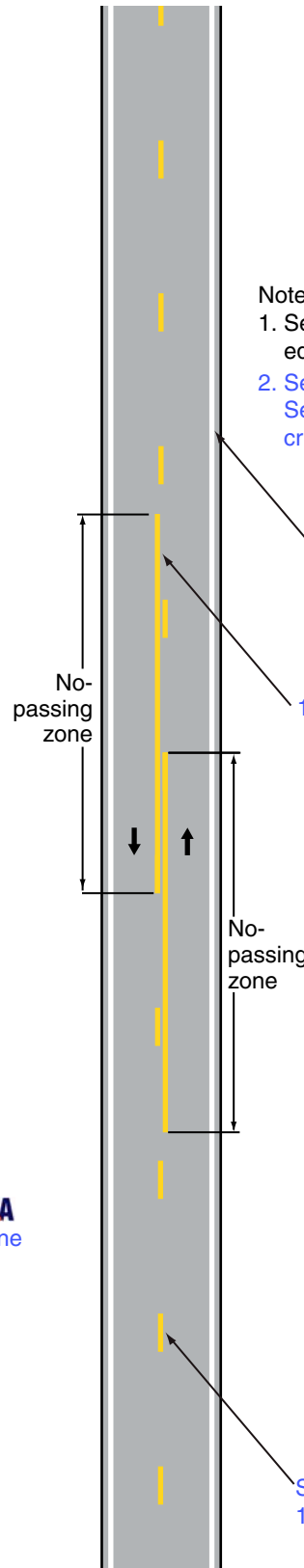
Option:

Centerline markings may be placed on other paved two-way traveled ways that are 4.9 m (16 ft) or more in width.

If a traffic count is not available, the ADTs described in this Section may be estimates that are based on engineering judgment.

Figure 3B-1. Examples of Two-Lane, Two-Way Marking Applications**a - Typical two-lane, two-way marking
with passing permitted in both directions**

Standard Broken
125 mm (5 in) Yellow Line

**b - Typical two-lane, two-way marking
with no passing zones**

Notes:

1. See Section 3B.07 for edge line warrants.

2. See Section 2B.29 and Section 2B.30 for signing criteria.

Legend

→ Direction of travel

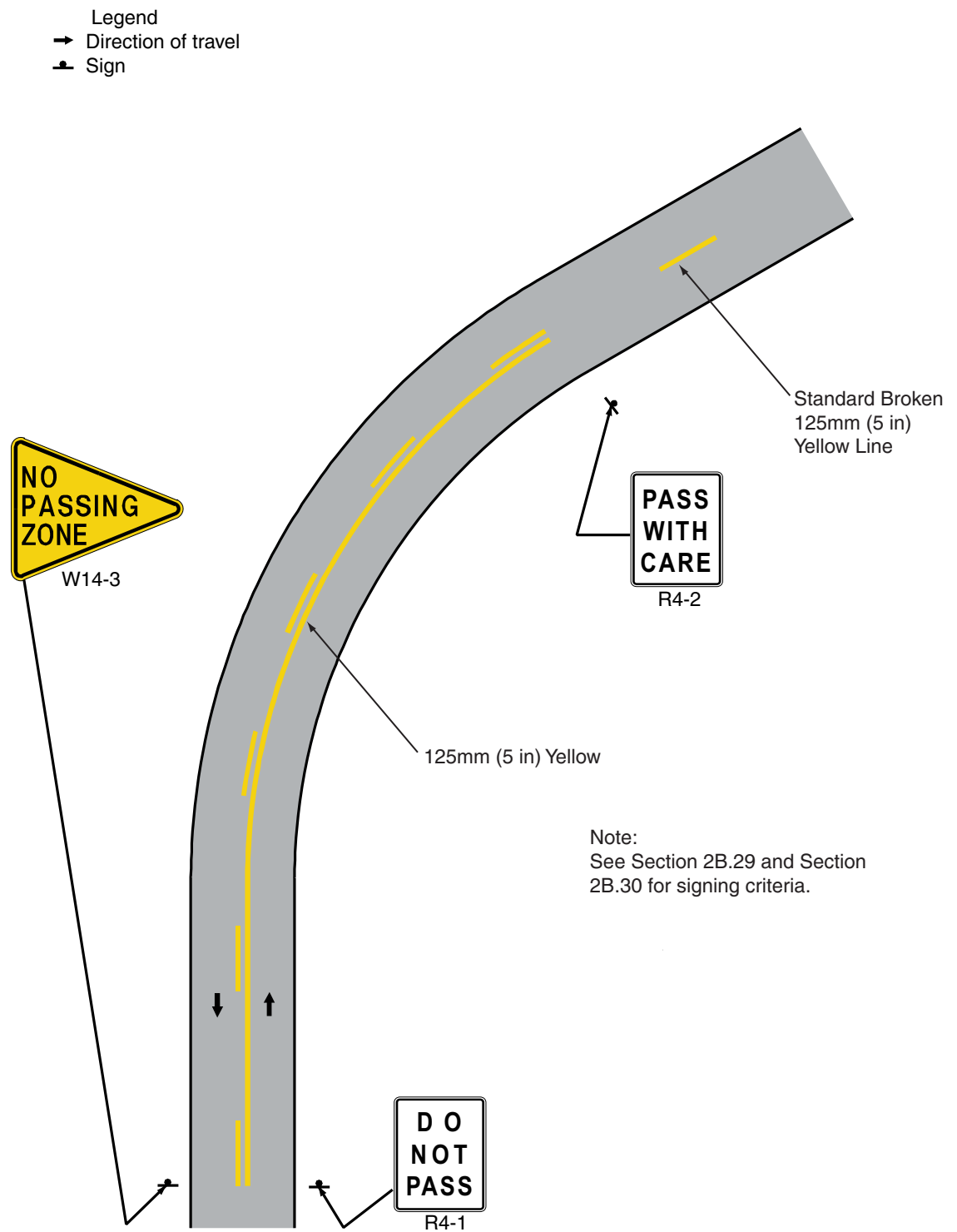
125 mm (5 in) White

125 mm (5 in) Yellow

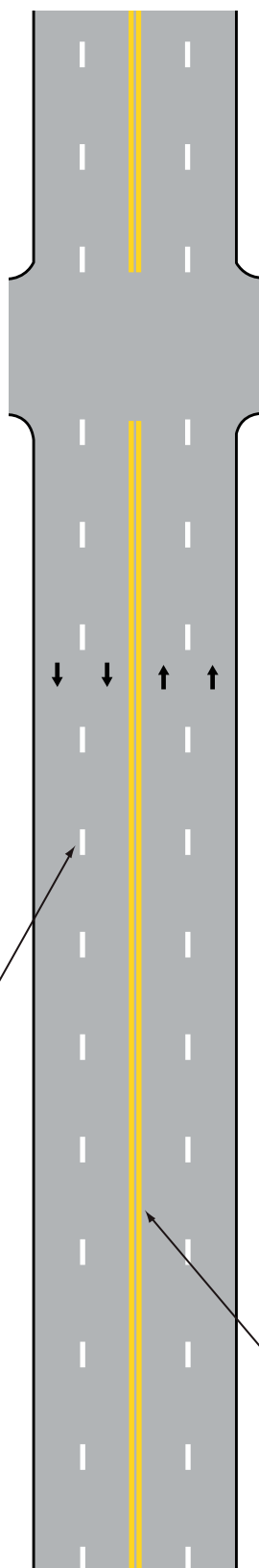
Standard Broken
125 mm (5 in) Yellow Line

Figure 3B-1a. Examples of NO-PASSING Zone Pavement Marking Application

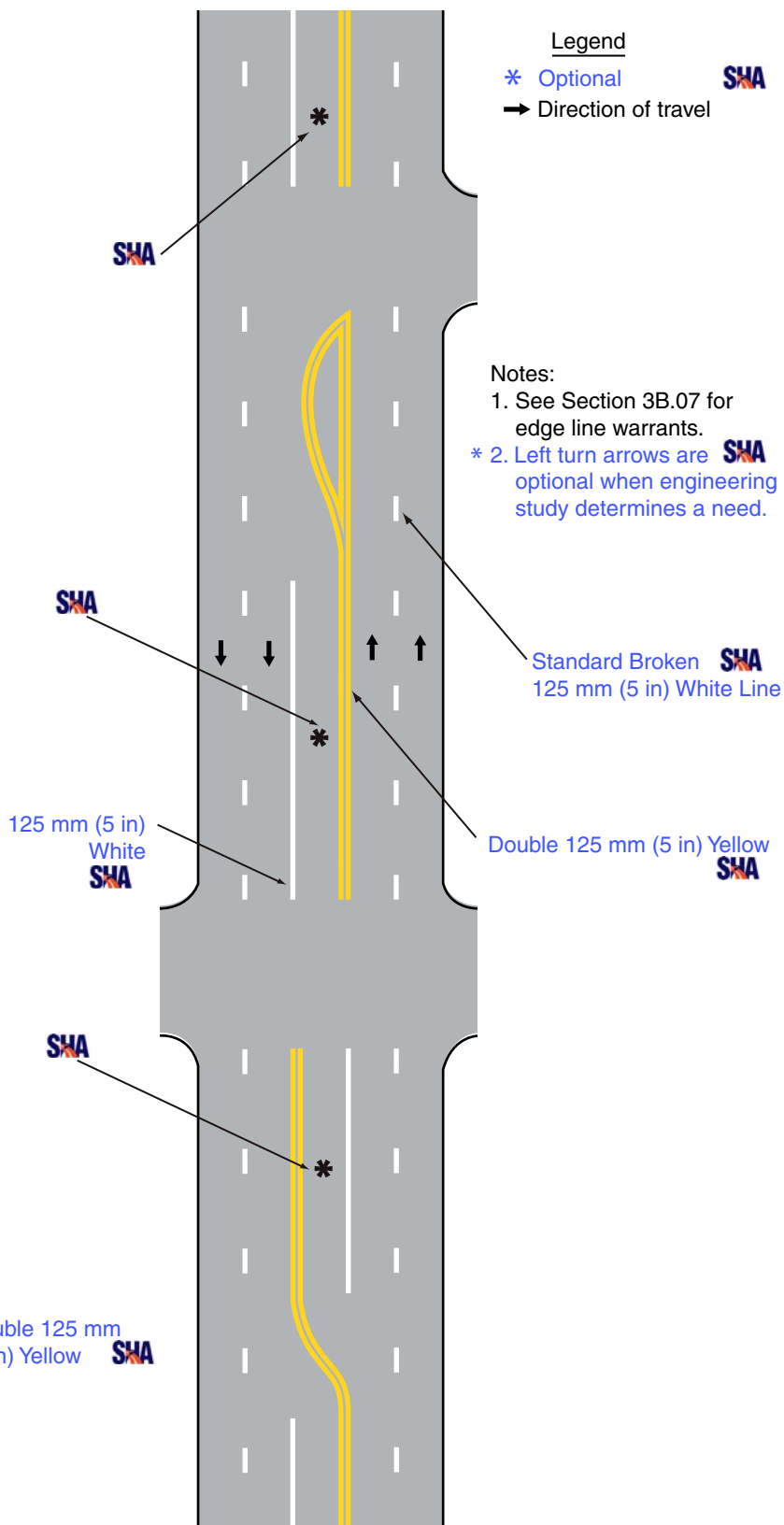
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**a - Typical multi-lane,
two-way marking**



**b - Typical multi-lane, two-way marking
with single lane left turn channelization**



**Figure 3B-2a. Examples of Center Line (Multilane)
- Recessed or Raised Pavement Markers**

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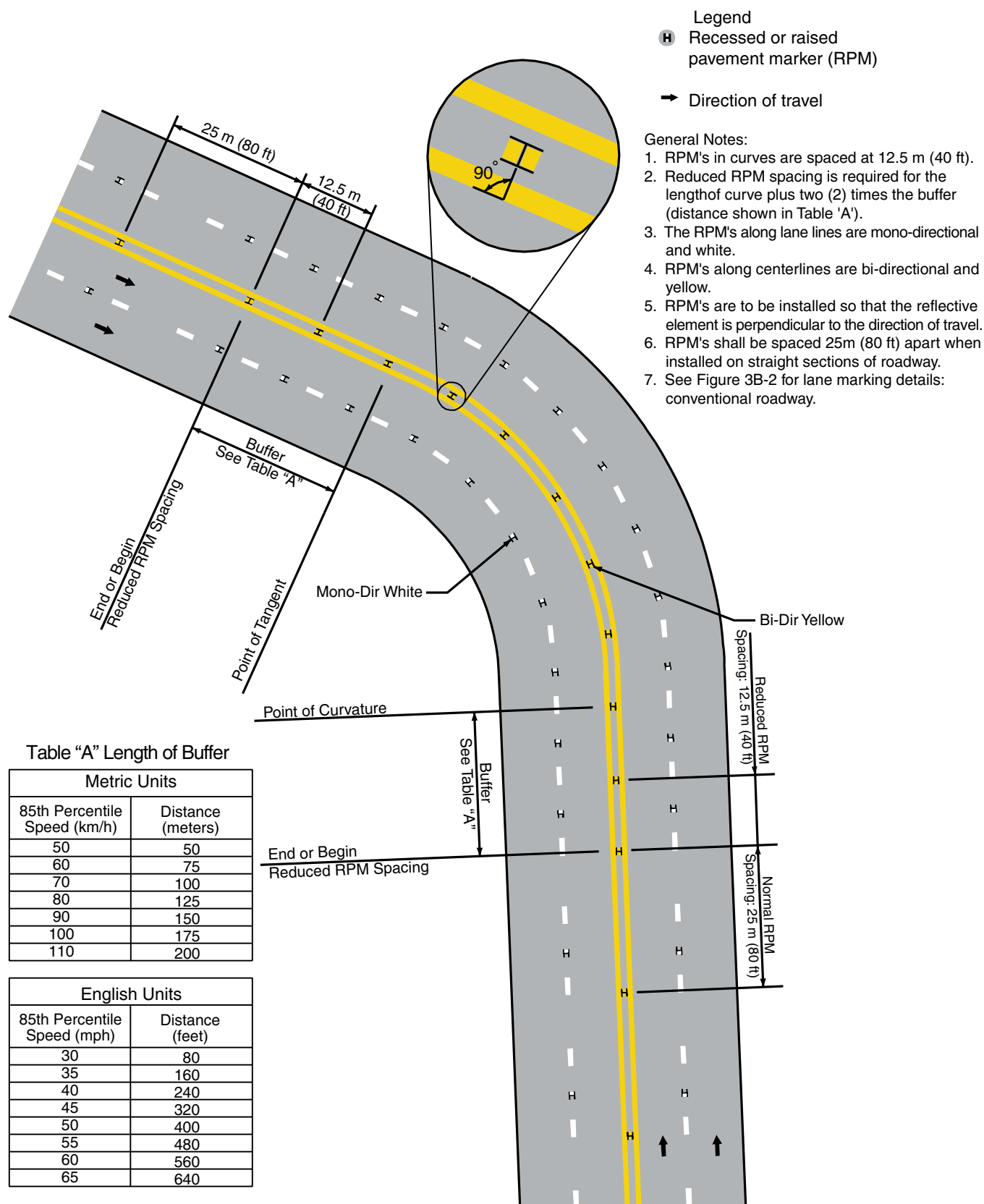
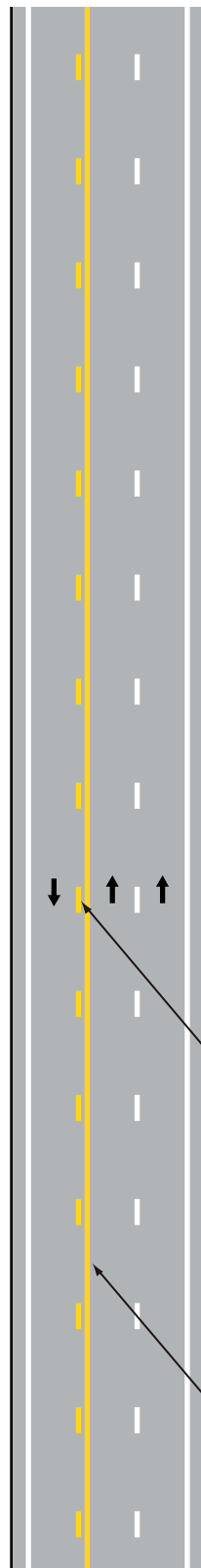


Figure 3B-3. Examples of Three-Lane, Two-Way Marking Applications

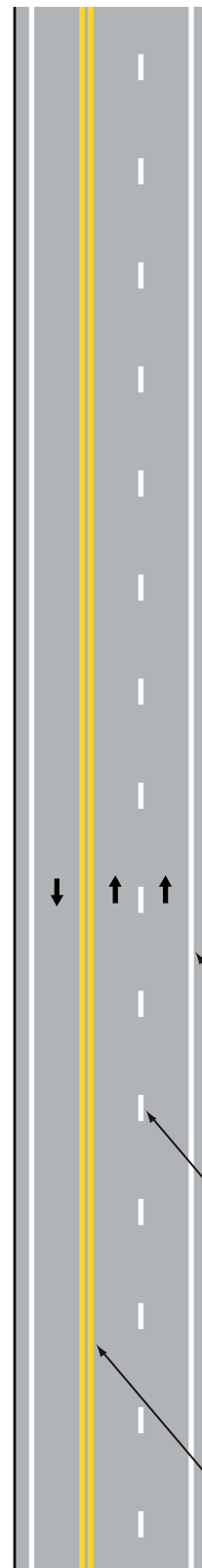
a - Typical three-lane, two-way marking with passing permitted in single-lane direction



Standard Broken
125 mm (5 in)
Yellow Line

125 mm (5 in) Yellow
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b - Typical three-lane, two-way marking with passing prohibited in single-lane direction



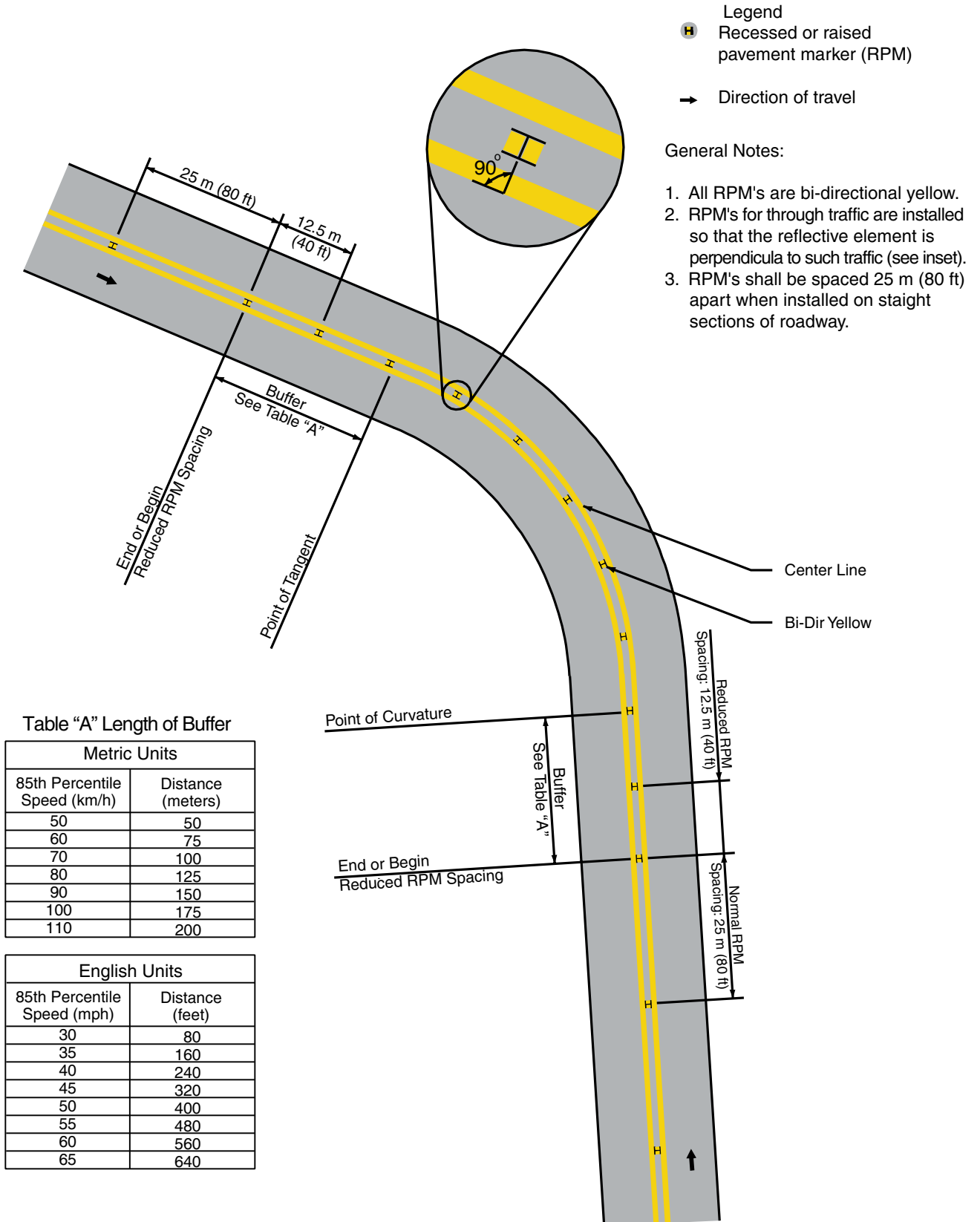
Legend
→ Direction of travel

125 mm (5 in) White
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Standard Broken
125 mm (5 in) White Line
SHA

Double 125 mm (5 in) Yellow
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Figure 3B-3a. Examples of No Passing Zone Marking Single Lane Application - Recessed or Raised Pavement Markers



Section 3B.02 No-Passing Zone Pavement Markings and Warrants

Standard:

No-passing zones shall be marked by either the one direction no-passing zone pavement markings or the two-direction no-passing zone pavement markings described previously and shown in Figures 3B-1 and 3B-3.

When centerline markings are used, no-passing zone markings shall be used on two-way roadways at lane reduction transitions (see Section 3B.09) and on approaches to obstructions that must be passed on the right (see Section 3B.10).

Guidance:

Where the distance between successive no-passing zones is less than 120 m (400 ft), no-passing markings should connect the zones.

Raised pavement markers, when used in No Passing zones, should conform to Figure 3B-3a.



Standard:

Where centerline markings are used, no-passing zone markings shall be used on approaches to highway-rail grade crossings in conformance with Section 8B.20.

Option:

In addition to pavement markings, no-passing zone signs (see Sections 2B.29, 2B.30, and 2C.35) may be used to emphasize the existence and extent of a no-passing zone.

Support:

Section 11-307 of the “Uniform Vehicle Code (UVC) Revised” contains further information regarding no-passing zones. The “UVC” can be obtained from the National Committee on Uniform Traffic Laws and Ordinances at the address shown on Page i.

Standard:

On two-way, two- or three-lane roadways where centerline markings are installed, no-passing zones shall be established at vertical and horizontal curves and other locations where an engineering study indicates that passing must be prohibited because of inadequate sight distances or other special conditions.

On three-lane roadways where the direction of travel in the center lane transitions from one direction to the other, a no-passing buffer zone shall be provided in the center lane as shown in Figure 3B-4. A lane transition shall be provided at each end of the buffer zone.

The buffer zone shall be a median island that is at least 15 m (50 ft) in length.

Guidance:

For three-lane roadways having a posted or statutory speed limit of 70 km/h (45 mph) or greater, the lane transition taper length should be computed by the formula $L = 0.62 WS$ for speeds in km/h ($L = WS$ for speeds in mph). For roadways where the posted or statutory speed limit is less than 70 km/h (45 mph), the formula $L = WS^2/155$ for speeds in km/h ($L = WS^2/60$ for speeds in mph) should be used to compute taper length. Under both formulas, L equals the taper length in meters (feet), W equals the width of the center lane or offset distance in meters (feet), and S equals the 85th-percentile speed or the posted or statutory speed limit, whichever is higher.

Standard:

The minimum lane transition taper length shall be 30 m (100 ft) in urban areas and 60 m (200 ft) in rural areas.

On roadways with centerline markings, no-passing zone markings shall be used at horizontal or vertical curves where the passing sight distance is less than the minimum necessary for reasonably safe passing at the 85th-percentile speed or the posted or statutory speed limit as shown in Table 3B-1. The passing sight distance on a vertical curve is the distance at which an object 1.07 m (3.5 ft) above the pavement surface can be seen from a point 1.07 m (3.5 ft) above the pavement (see Figure 3B-5). Similarly, the passing sight distance on a horizontal curve is the distance measured along the centerline (or right-hand lane line of a three-lane roadway) between two points 1.07 m (3.5 ft) above the pavement on a line tangent to the embankment or other obstruction that cuts off the view on the inside of the curve (see Figure 3B-5).

Support:

The beginning of a no-passing zone at point “a” in Figure 3B-5 is that point where the sight distance first becomes less than that specified in Table 3B-1. The end of the no-passing zone at point “b” in Figure 3B-5 is that point at which the sight distance again becomes greater than the minimum specified.

Figure 3B-4. Example of Three-Lane, Two-Way Marking for Changing Direction of the Center Lane

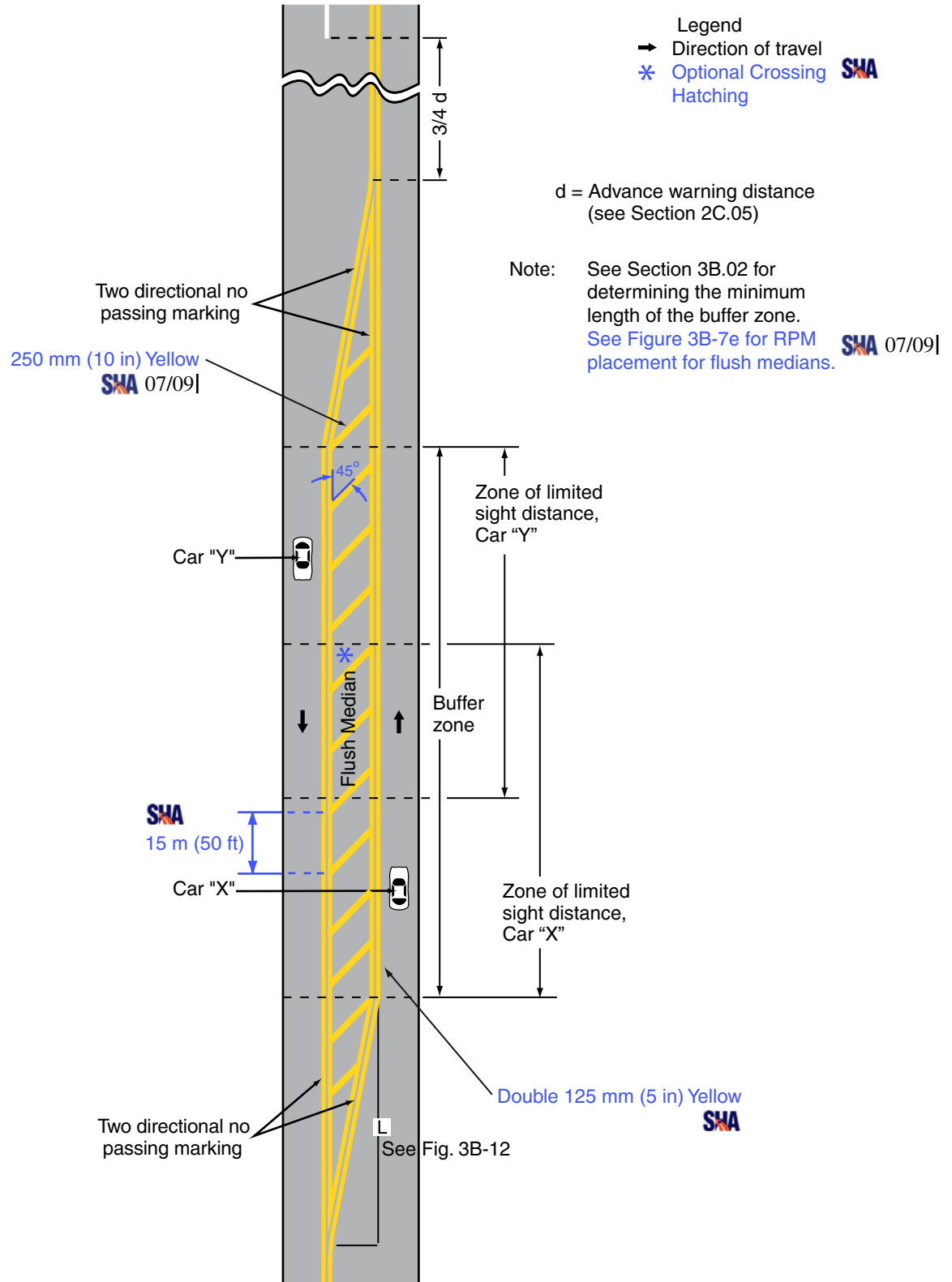
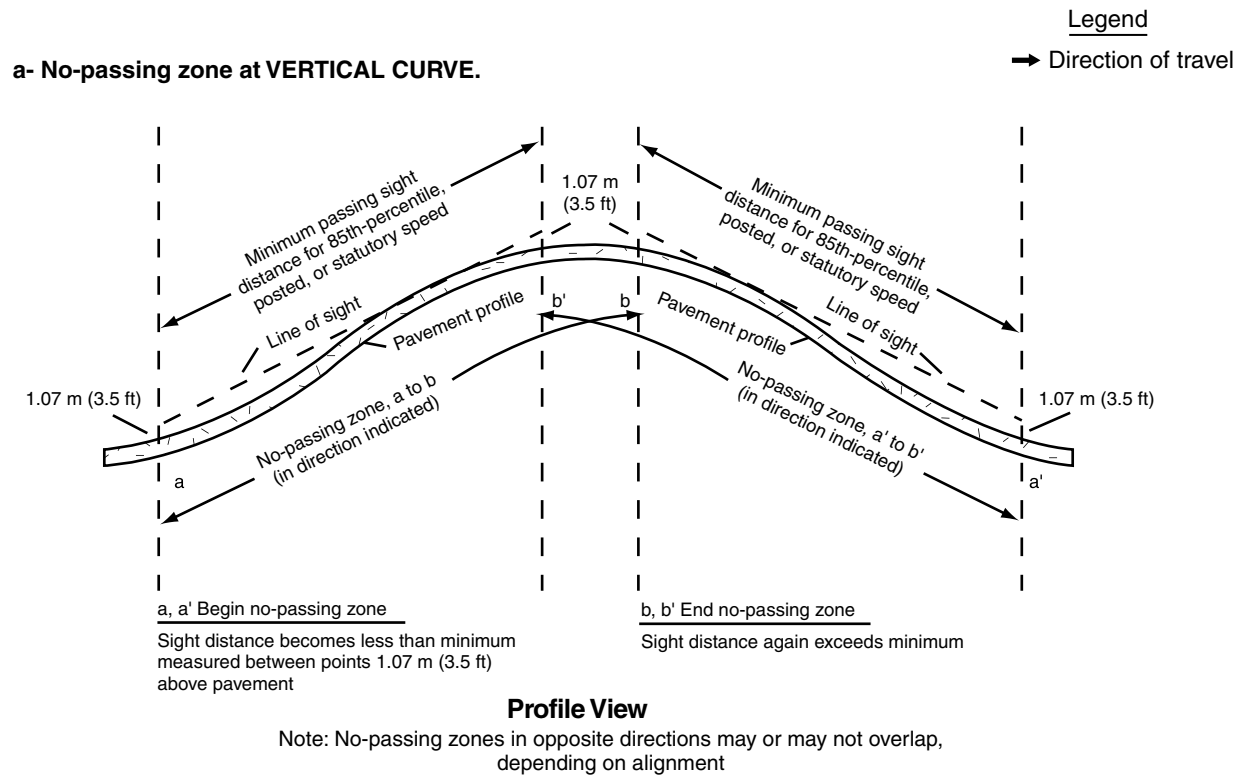
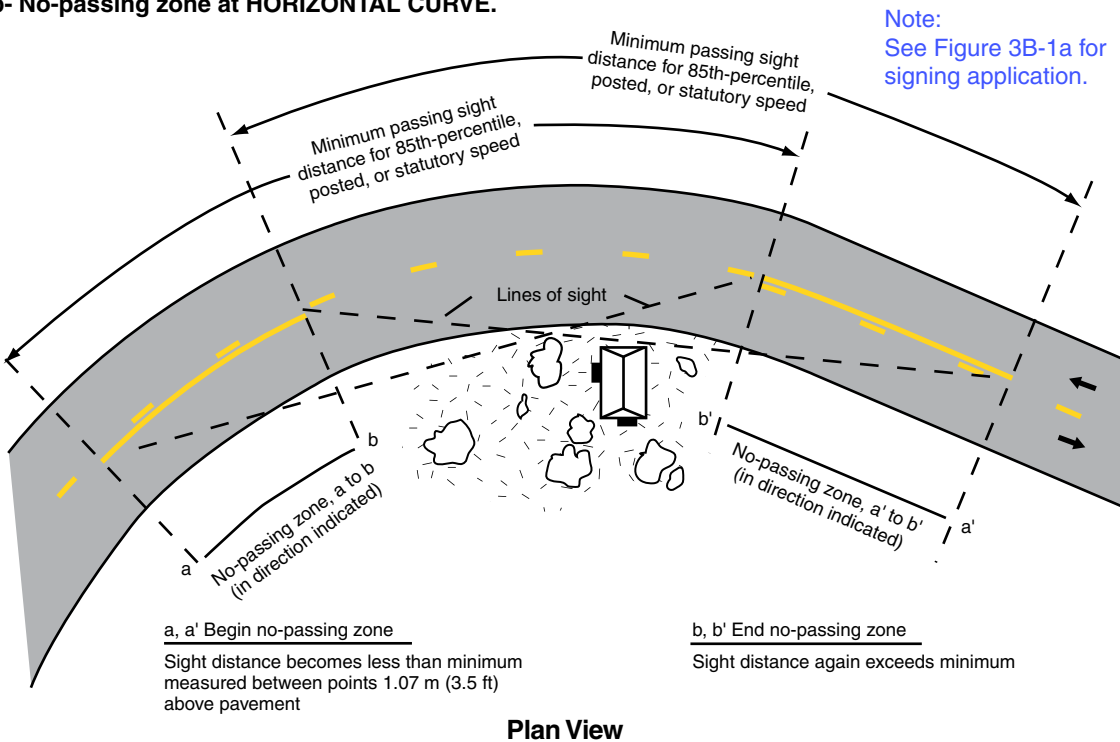


Figure 3B-5. Method of Locating and Determining the Limits of No-Passing Zones at Curves



b- No-passing zone at HORIZONTAL CURVE.



Not to scale

Table 3B-1. Minimum Passing Sight Distances

85th- Percentile or Posted or Statutory Speed Limit (km/h)	Minimum Passing Sight Distance (meters)	85th- Percentile or Posted or Statutory Speed Limit (mph)	Minimum Passing Sight Distance (feet)
40	140	25	450
50	160	30	500
60	180	35	550
70	210	40	600
80	245	45	700
90	280	50	800
100	320	55	900
110	355	60	1,000
120	395	65	1,100
		70	1,200

Section 3B.03 Other Yellow Longitudinal Pavement Markings**Standard:**

If reversible lanes are used, the lane line pavement markings on each side of reversible lanes shall consist of a normal double broken yellow line to delineate the edge of a lane in which the direction of travel is reversed from time to time, such that each of these markings serve as the centerline markings of the roadway during some period (see Figure 3B-6).

Signs (see Section 2B.25), lane-use control signals (see Chapter 4J), or both shall be used to supplement reversible lane pavement markings.

If a two-way left-turn lane that is never operated as a reversible lane is used, the lane line pavement markings on each side of the two-way left-turn lane shall consist of a normal broken yellow line and a normal solid yellow line to delineate the edges of a lane that can be used by traffic in either direction as part of a left-turn maneuver. These markings shall be placed with the broken line toward the two-way left-turn lane and the solid line toward the adjacent traffic lane as shown in Figure 3B-7.

When an exclusive left turn segment is inserted within a two-way left turn system, one or more left turn arrows shall be used to indicate the nature of that segment. The word "ONLY" shall not be used. See Figure 3B-7a for details.

Guidance:

Raised pavement markers, when used in left turn lane with two-way center left turn, should conform to Figure 3B-7b.

Guidance:

Signs should be used in conjunction with the two-way left turn markings (see Section 2B.24).

Standard:

If a continuous median island formed by pavement markings separating travel in opposite directions is used, two sets of double solid yellow lines shall be used to form the island as shown in Figures 3B-2 and 3B-4. Other markings in the median island area shall also be yellow, except crosswalk markings which shall be white (see Section 3B.17).

Figure 3B-6. Example of Reversible Lane Marking Application

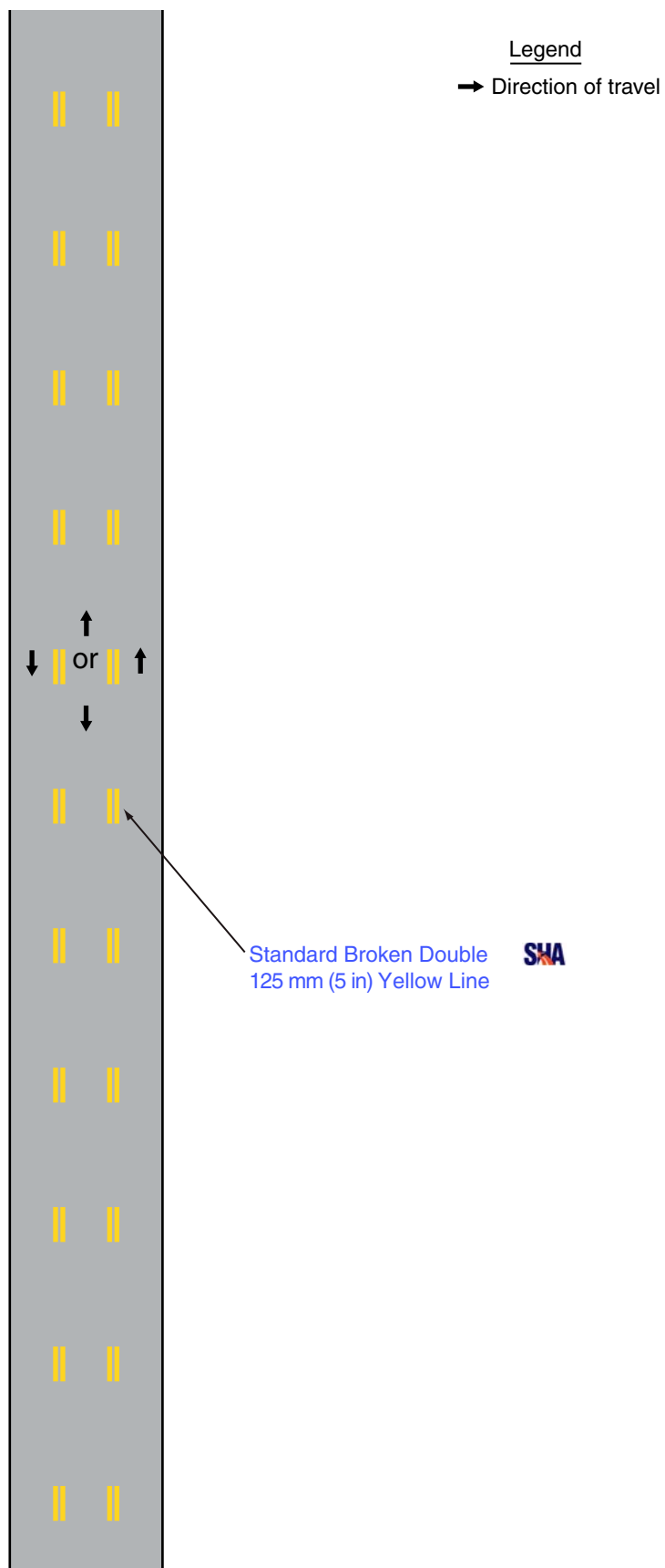


Figure 3B-7. Example of Two-Way Left-Turn Lane Marking Applications

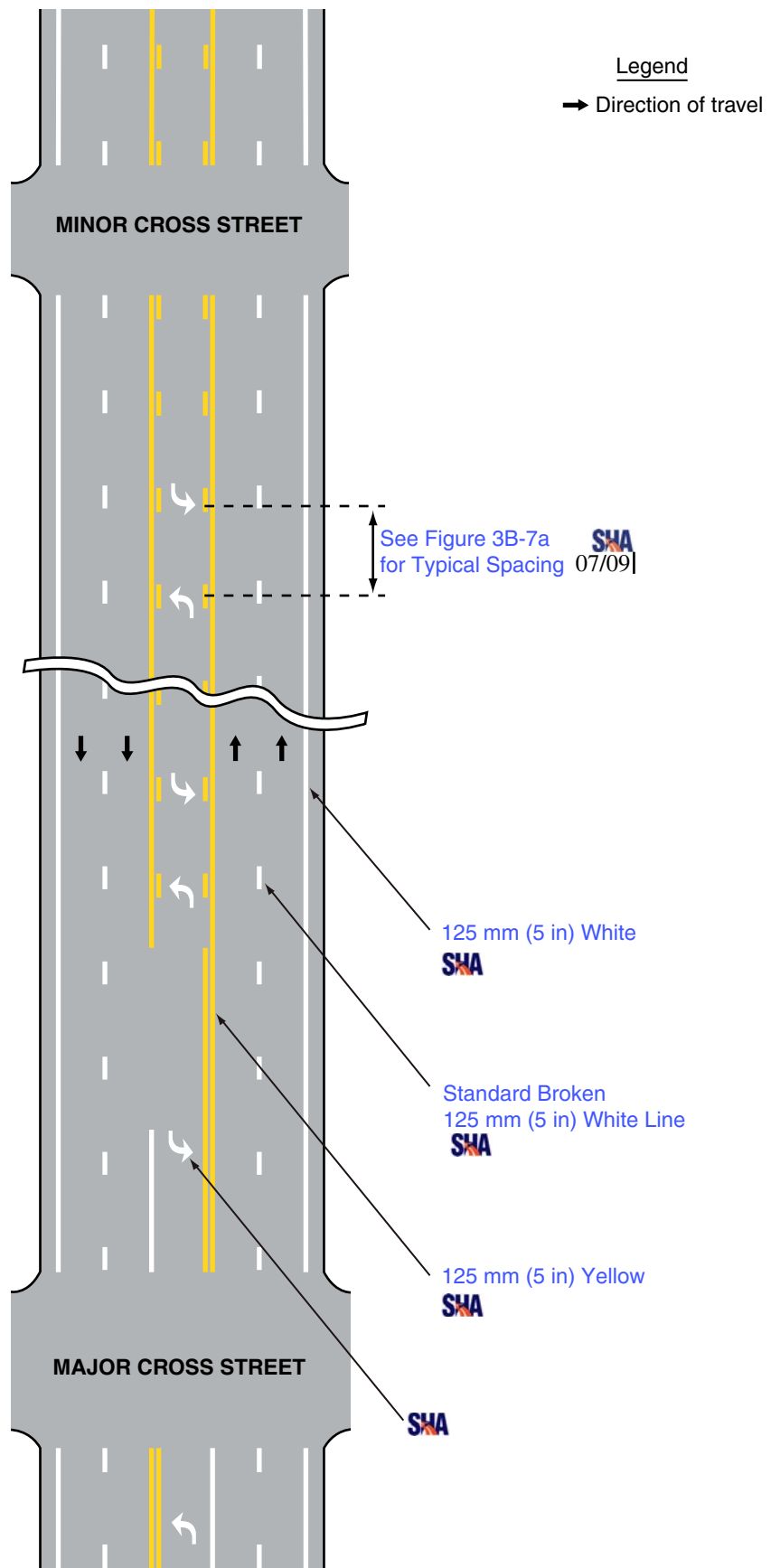


Figure 3B-7a. Examples of Combination Lane and Centerline Markings - Two-way Left Turn Lane.

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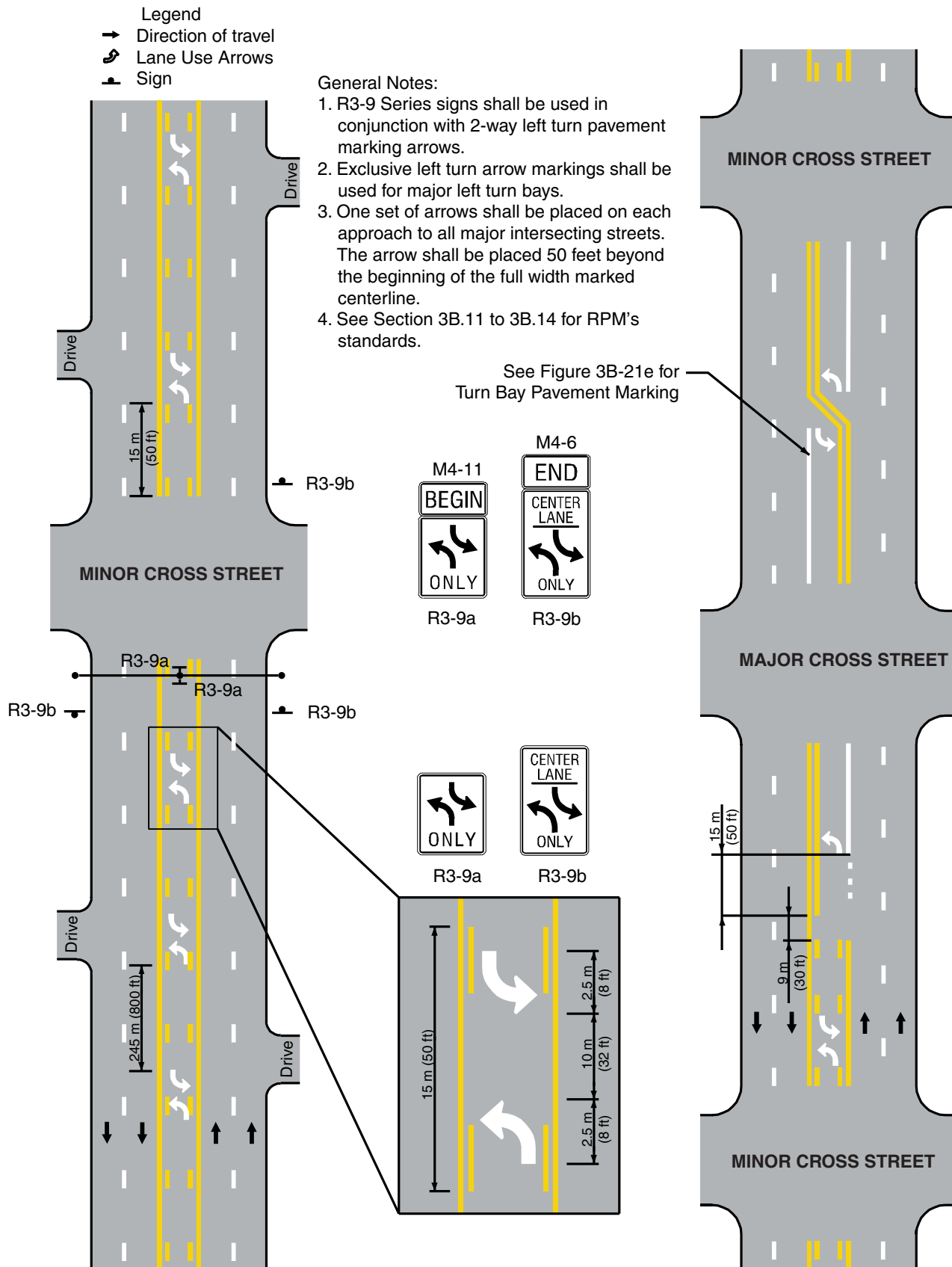
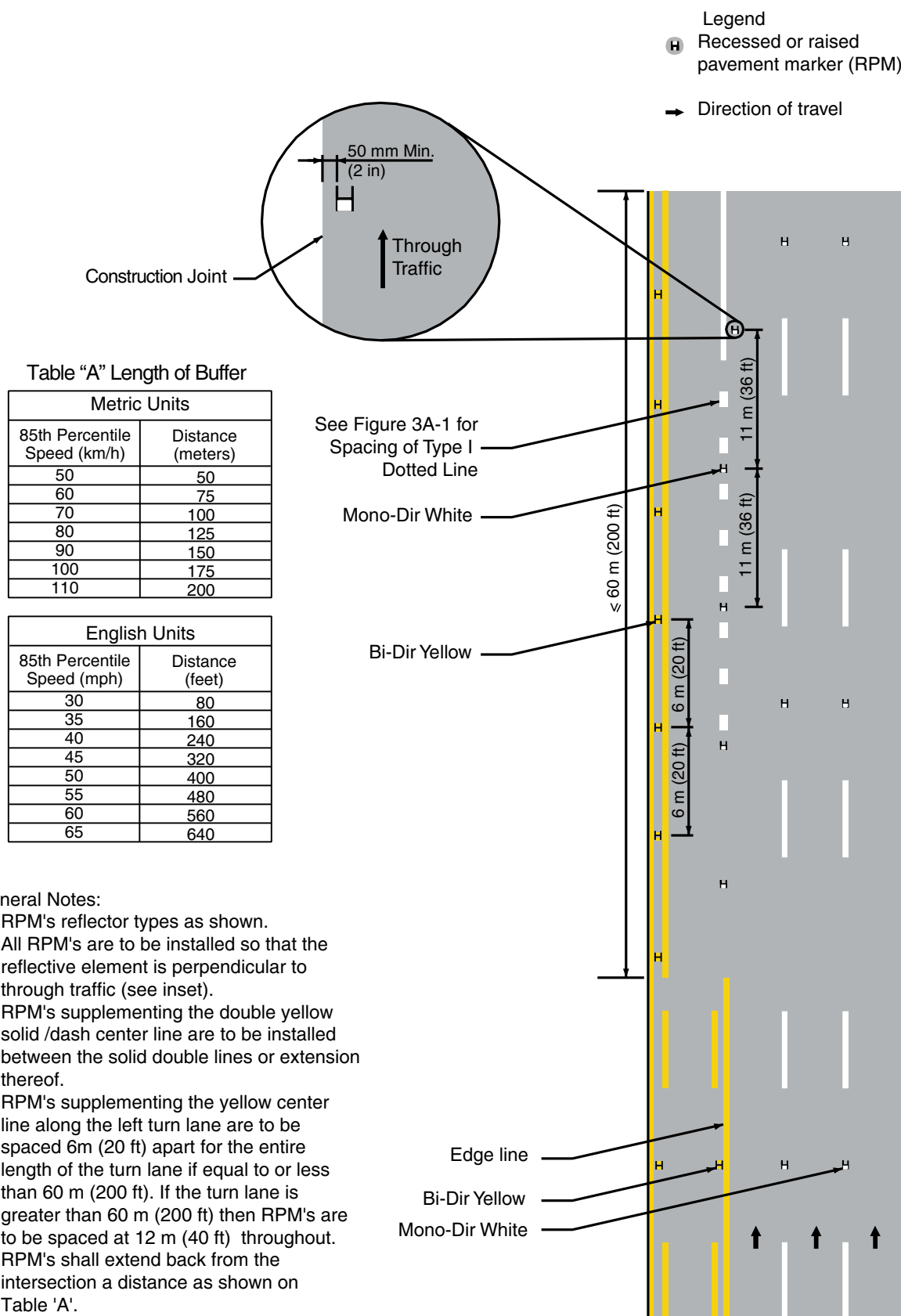


Figure 3B-7b. Examples of Left Turn Lane with Two-way Center Left Turn - Recessed or Raised Pavement Markers.

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General Notes:

1. RPM's reflector types as shown.
2. All RPM's are to be installed so that the reflective element is perpendicular to through traffic (see inset).
3. RPM's supplementing the double yellow solid /dash center line are to be installed between the solid double lines or extension thereof.
4. RPM's supplementing the yellow center line along the left turn lane are to be spaced 6m (20 ft) apart for the entire length of the turn lane if equal to or less than 60 m (200 ft). If the turn lane is greater than 60 m (200 ft) then RPM's are to be spaced at 12 m (40 ft) throughout.
5. RPM's shall extend back from the intersection a distance as shown on Table 'A'.
6. RPM's along two way left turn lane and turn lane are optional

Section 3B.04 White Lane Line Pavement Markings and Warrants

Support:

Examples of lane line markings are shown in Figures 3B-2, 3B-3, 3B-7 through 3B-13, 3B-21a through 3B-21e, and 3B-26.



Examples of raised pavement markers supplementing lane line markings are shown in Figure 3B-2a, 3B-7b and 3B-7d.



Standard:

When used, lane line pavement markings delineating these paration of traffic lanes that have the same direction of travel shall be white.

Lane lines between adjacent traffic lanes shall be continued right up to the stop line as standard broken white lines as shown in Figures 3B-11, 3B-21a, 3B-21b, and 3B-21c.



Standard:

Where crossing the lane line markings with care is permitted, the lane line markings shall consist of a normal broken white line.

Where crossing the lane line markings is discouraged, the lane line markings shall consist of a normal solid white line.

Guidance:

Lane lines should not be converted to solid lines approaching intersections except in critical areas where it is advisable to discourage lane changing. However, a single solid white line should be used to separate a turn lane from the through-traffic lanes as also shown in Figures 3B-11, 3B-21a, 3B-21b, 3B-21c, and 3B-21d.

Lane lines should not be placed on construction joints. If a conflict occurs between the placement of a lane line and the construction joint on a multi-lane roadway, the right lane should be wider.



Option:

Solid white lane line markings may be used to separate through traffic lanes from auxiliary lanes, such as uphill truck lanes, left- or right-turn lanes, and preferential lanes. They may also be used to separate traffic lanes approaching an intersection.

Wide solid lane line markings may be used for greater emphasis.

Standard:

Where crossing the lane line markings is prohibited, the lane line markings shall consist of two normal solid white lines.

Lane line markings shall be used on all freeways and Interstate highways.

Guidance:

Lane line markings should be used on all roadways with two or more adjacent traffic lanes that have the same direction of travel. Lane line markings should also be used at congested locations where the roadway will accommodate more traffic lanes with lane line markings than without the markings.

Guidance:

Dotted white lane line markings (see Section 3A.05) should be used to alert drivers when they are operating in a non-continuous lane. Non-continuous lanes include acceleration lanes, deceleration lanes, combination accel-decel lanes, mandatory turn lanes, and other lanes reduced downstream.

Typical applications are illustrated in Figures 3B-7d, 3B-7e, and 3B-8 through 3B-12b. Also see Section 3B.19 with special reference to Lane Drops.

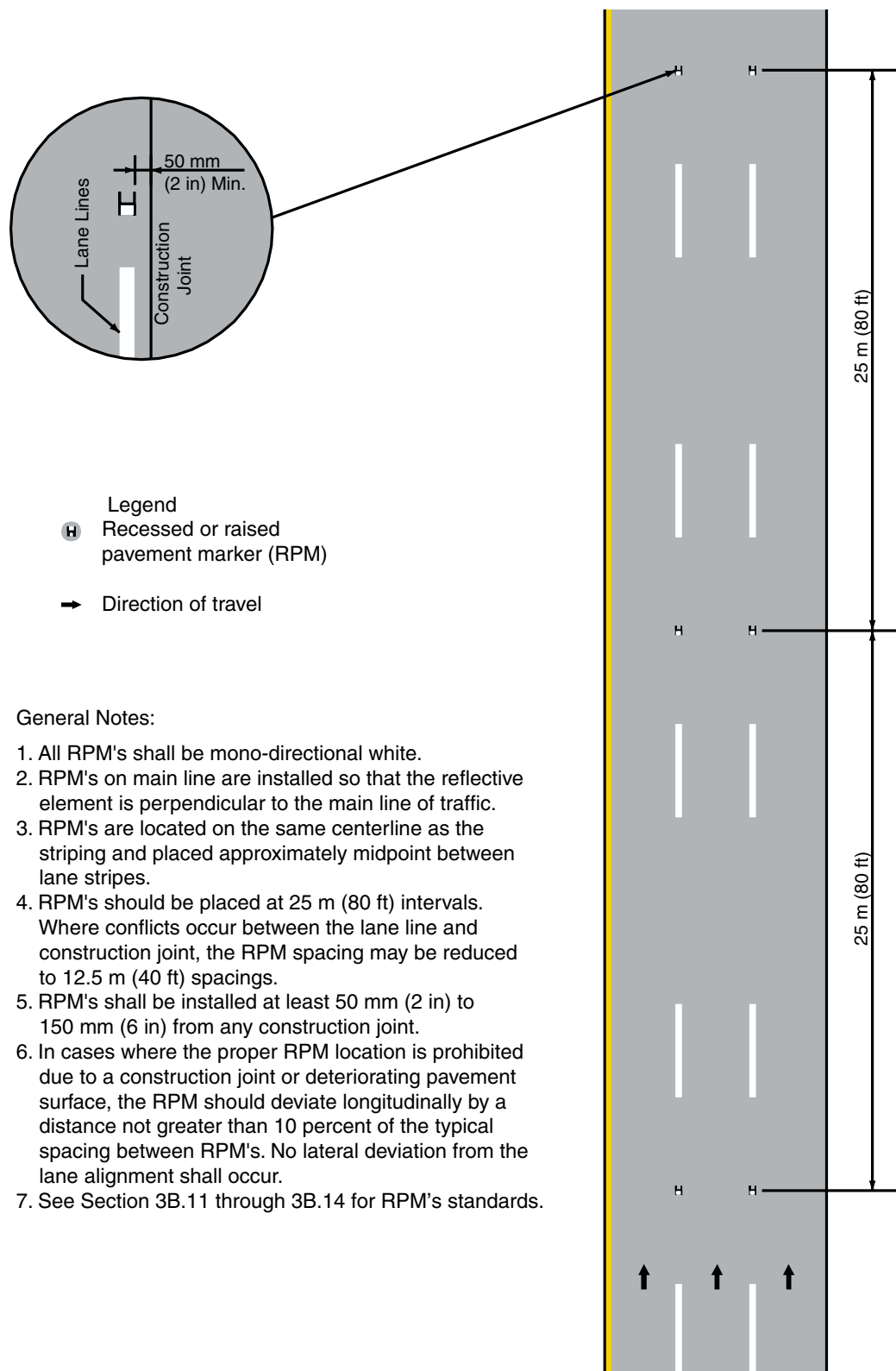
Dotted white lane lines should be used to separate by-pass lane and regular travel lane. Typical applications are illustrated in Figures 3B-7f.



Support:

The “Application and Design Guidelines for Shoulder Bypass Lanes” contains further information regarding pavement markings for shoulder bypass lanes. This document can be obtained from the Maryland State Highway Administration’s Office of Traffic & Safety, Traffic Development & Support Division (TDSD) at the address shown on Page i.

07/09|

Figure 3B-7c. Examples of Recessed or Raised Pavement Markers

**Figure 3B-7d. Examples of Left Turn Lane
- Recessed or Raised Pavement Markers.**

SHA 07/09

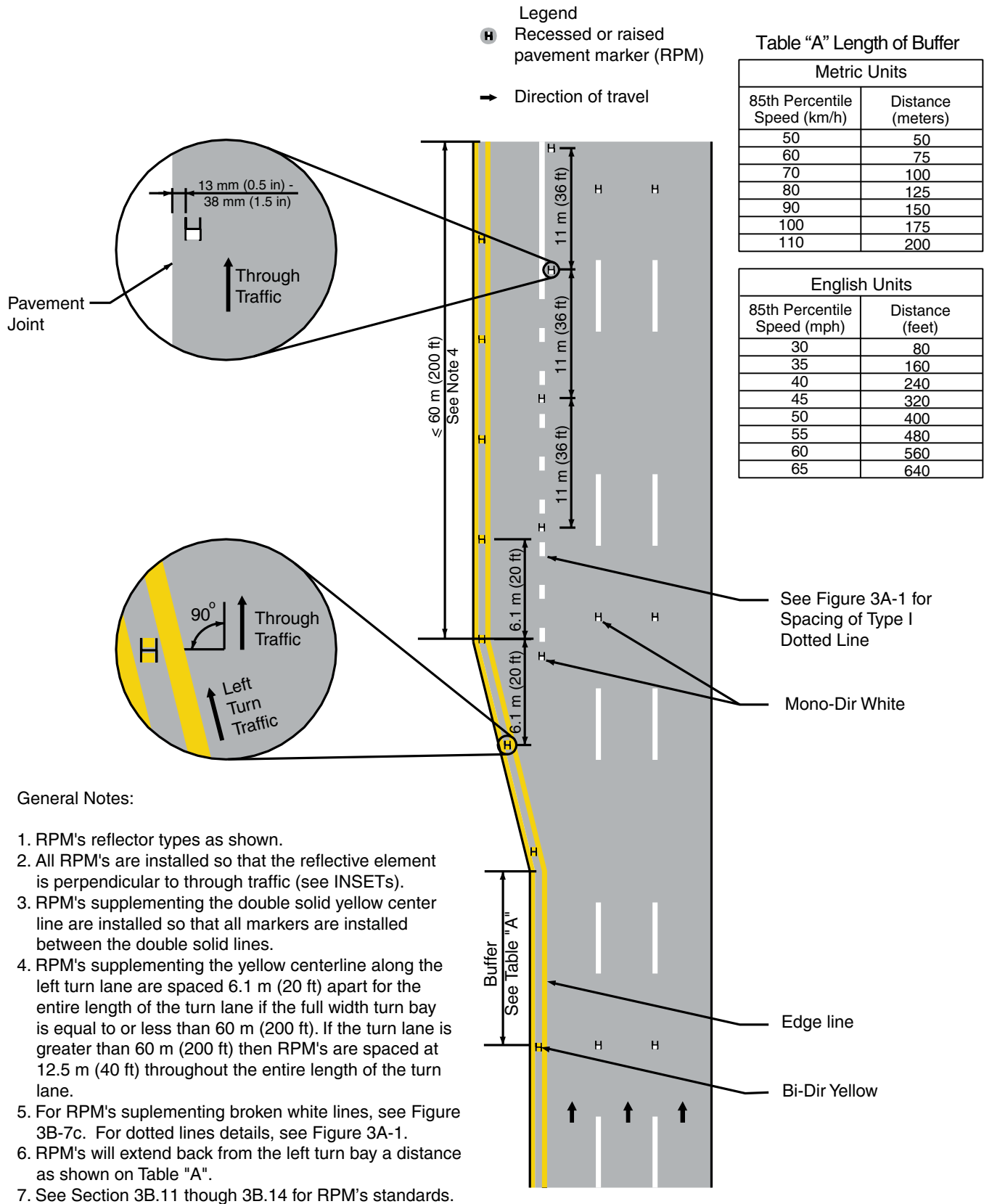
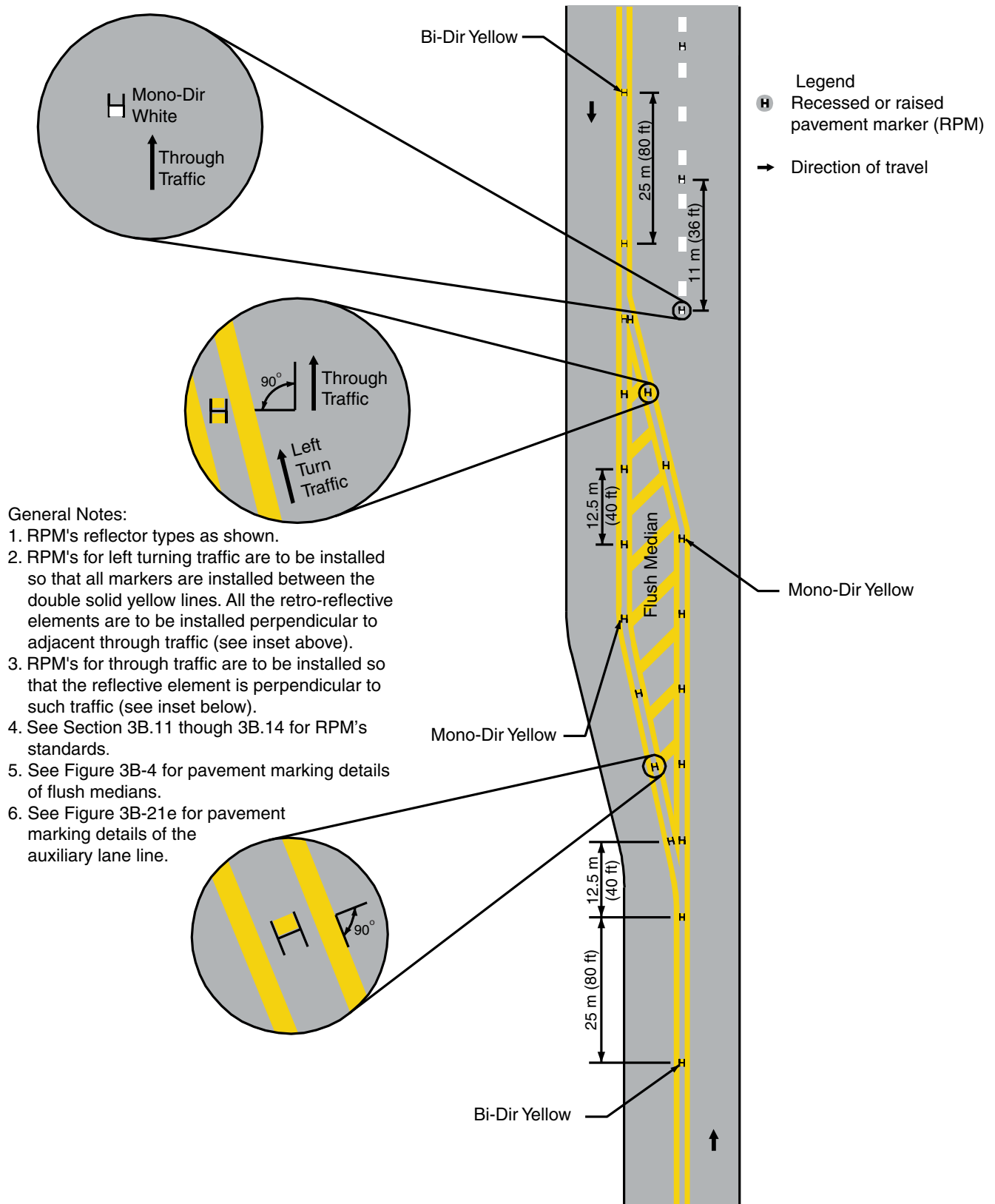


Figure 3B-7e, Examples of Left Turn Lane (Flush Median)
- Recessed or Raised Pavement Markers.



**Figure 3B-7f. Examples of Auxiliary Lane Lines
- By-pass Lane.**

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Departure Taper L (Metric Unit):

For $S \leq 70$ km/h, $L = W(S-10)^2 / 155$

For $S > 70$ km/h, $L = 0.62W(S-10)$

W = Lane Width (m)

S = 85th percentile Prevailing Speed (km/h)

Departure Taper L (U.S. Unit):

For $S \leq 45$ mph, $L = W(S-10)^2 / 60$

For $S > 45$ mph, $L = W(S-10)$

W = Lane Width (ft)

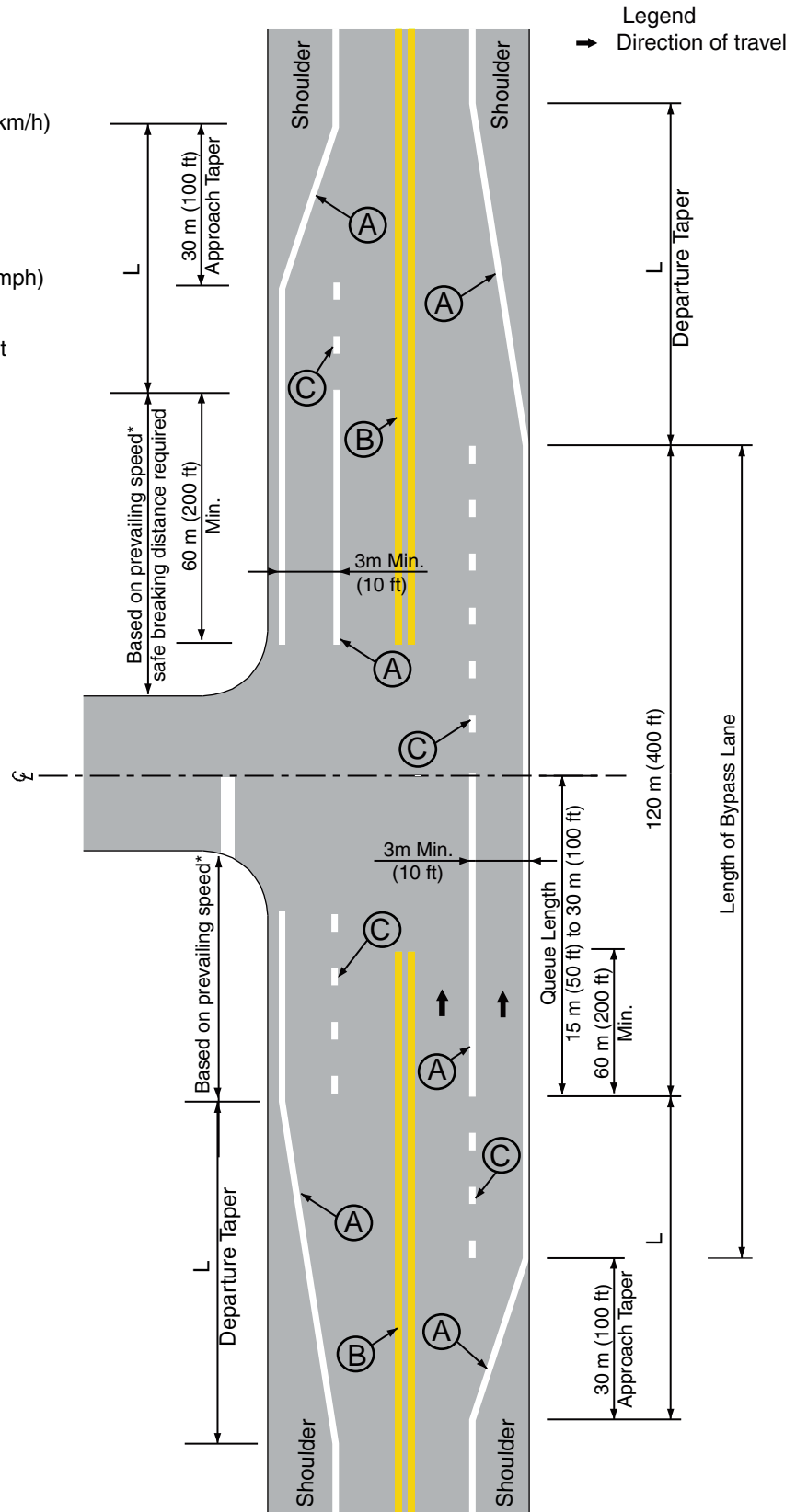
S = 85th percentile Prevailing Speed (mph)

* The length of the auxiliary lane should be determined by referencing the latest edition of AASHTO's "A Policy on Geometric Design of Highways and Streets".

(A) 125 mm (5 in) white

(B) Double 125 mm (5 in) Yellow

(C) See Figure 3A-1 for spacing of Type I Dotted Lines



Section 3B.05 Other White Longitudinal Pavement Markings

Standard:

A channelizing line shall be a wide or double solid white line.


Option:

Channelizing lines may be used to form channelizing islands where traffic traveling in the same direction is permitted on both sides of the island.


Standard:

Other pavement markings in the channelizing island area shall be white.

Support:

Examples of channelizing line and raised pavement marker applications are shown in Figures 3B-8, 3B-9, 3B-9a through 3B-9e, 3B-10, 3B-10a through 3B-10e, and 3B-13. 


Channelizing lines at exit ramps as shown in Figure 3B-8 define the neutral area, direct exiting traffic at the proper angle for smooth divergence from the main lanes into the ramp, and reduce the probability of colliding with objects adjacent to the roadway.

Channelizing lines at entrance ramps as shown in Figure 3B-9 through 3B-9e promote reasonably safe and efficient merging with the through traffic. 

Standard:


For exit ramps, channelizing lines shall be placed along the sides of the neutral area adjacent to the through traffic lane and the ramp lane. With a parallel deceleration lane, a lane line shall be extended as shown in Figures 3B-8.

Option:

White chevron markings may be placed in the neutral area for special emphasis as shown in Figure 3B-9e. 


Guidance:

For entrance ramps, a channelizing line should be placed along the side of the neutral area adjacent to the ramp lane.


For entrance ramps with a parallel acceleration lane, a lane line should be as shown in Figure 3B-9a through 3B-9d. 

Option:

For entrance ramps with a tapered acceleration lane, lane line markings may be placed to extend the channelizing line, but not beyond a point where the tapered lane meets the near side of the through traffic lane as shown in Figure 3B-9.

Lane drop markings as shown in Figure 3B-10 through 3B-10d may be use in advance of lane drop at exit ramps to distinguish a lane drop from a normal exit ramp or from an auxiliary lane. The lane drop marking may consist of a wide, white dotted line with line (Type II) segments 0.9 m (3 ft) in length separated by 2.7 m (9 ft) gaps. 

Guidance:

If used, lane drop markings should begin a minimum of 800 m (0.5 mile) in advance of the theoretical gore point. 

Option:

Where lane changes might cause conflicts, a wide solid white channelizing line may extend upstream from the theoretical gore point.

Figure 3B-8. Examples of Channelizing Line Applications or Exit Ramp Markings (Sheet 1 of 4)

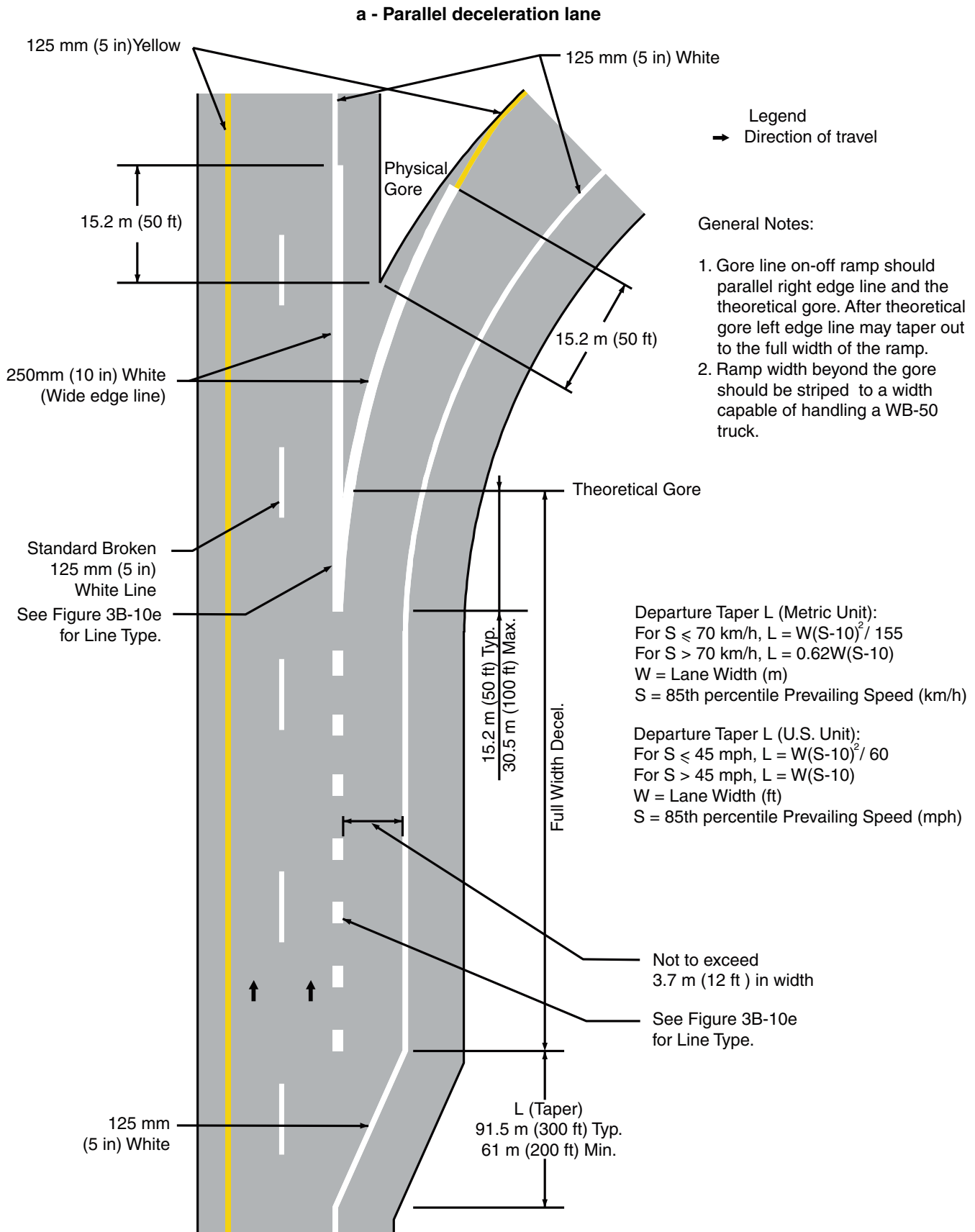


Figure 3B-8. Examples of Channelizing Line Applications or Exit Ramp Markings (Sheet 2 of 4)

b - Parallel deceleration lane - Recessed or Raised Pavement Markers

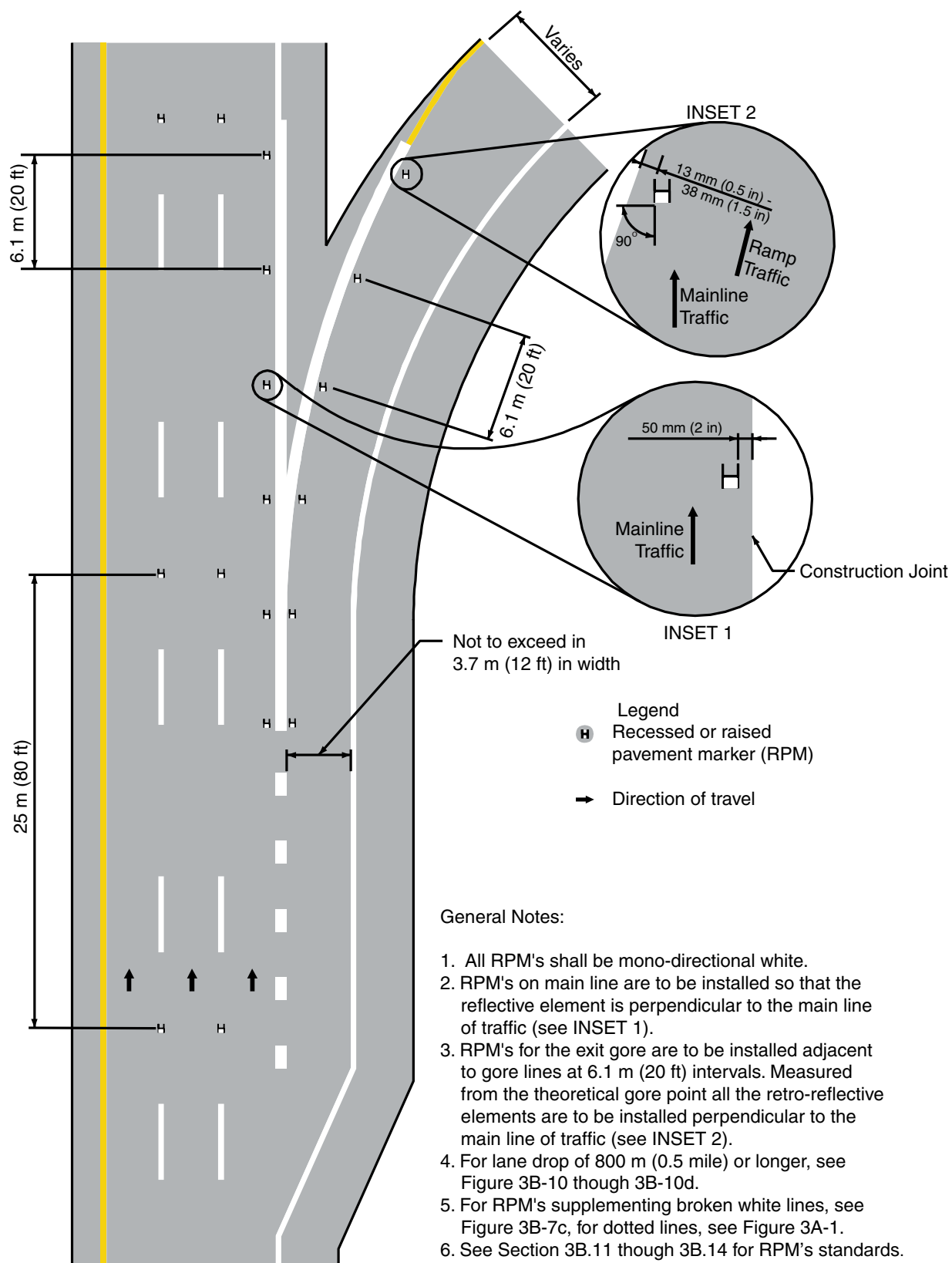


Figure 3B-8. Examples of Channelizing Line Applications or Exit Ramp Markings (Sheet 3 of 4)



c - Tapered deceleration lane

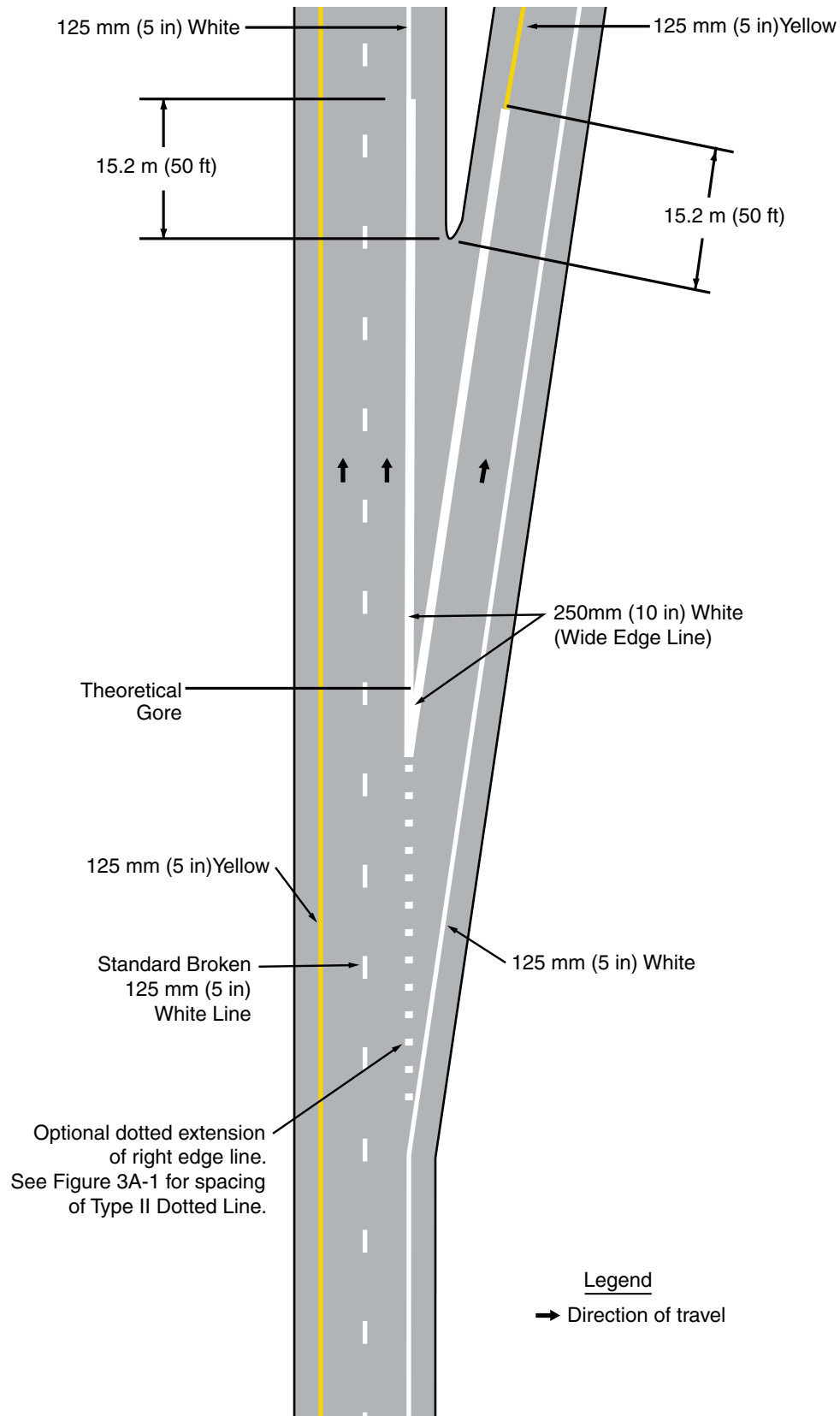


Figure 3B-8. Examples of Channelizing Line Applications or Exit Ramp Markings (Sheet 4 of 4)



d - Tapered deceleration lane - Recessed or Raised Pavement Markers

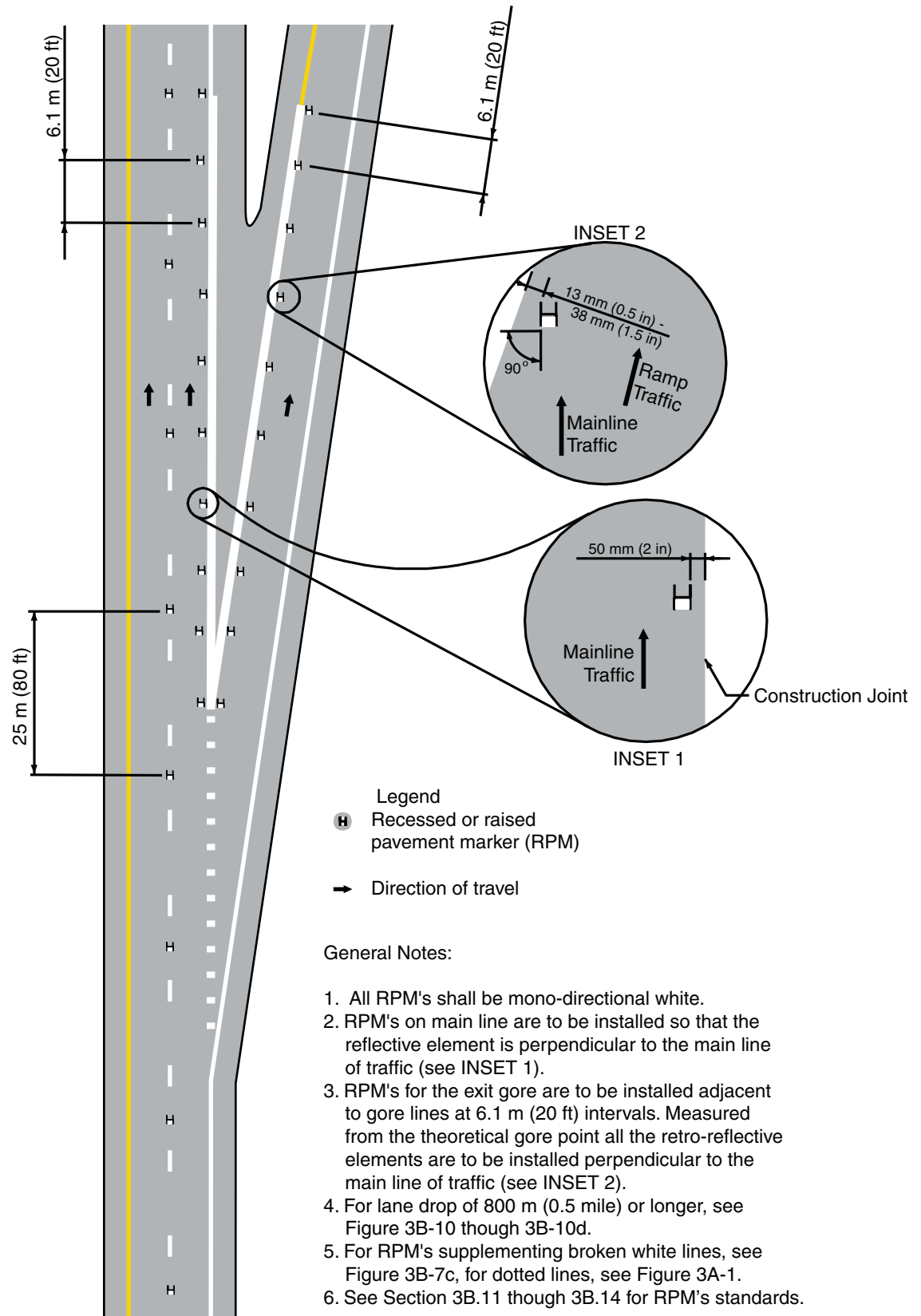


Figure 3B-9. Examples of Channelizing Line Applications for Entrance Ramp Markings (Sheet 1 of 4)

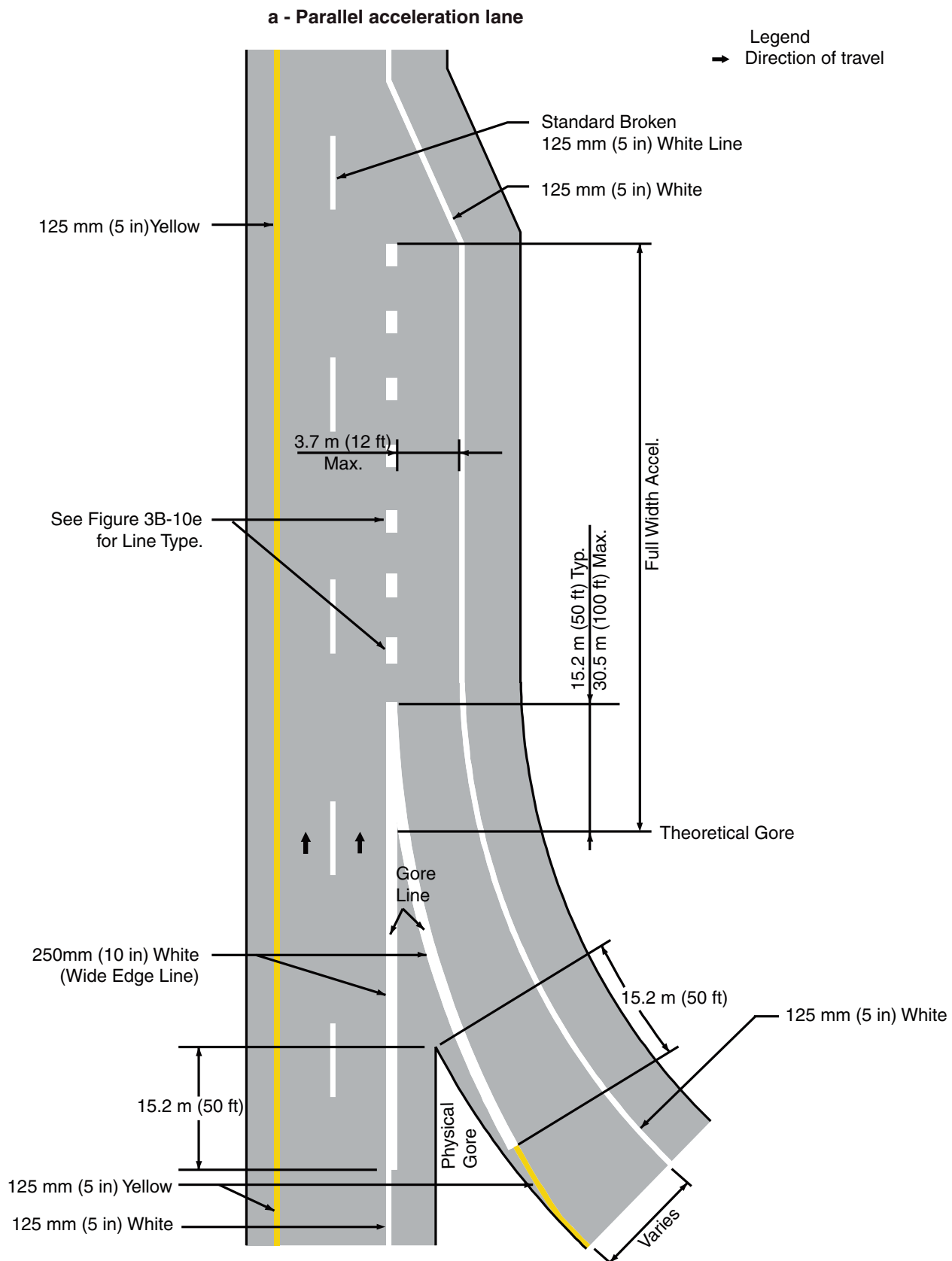
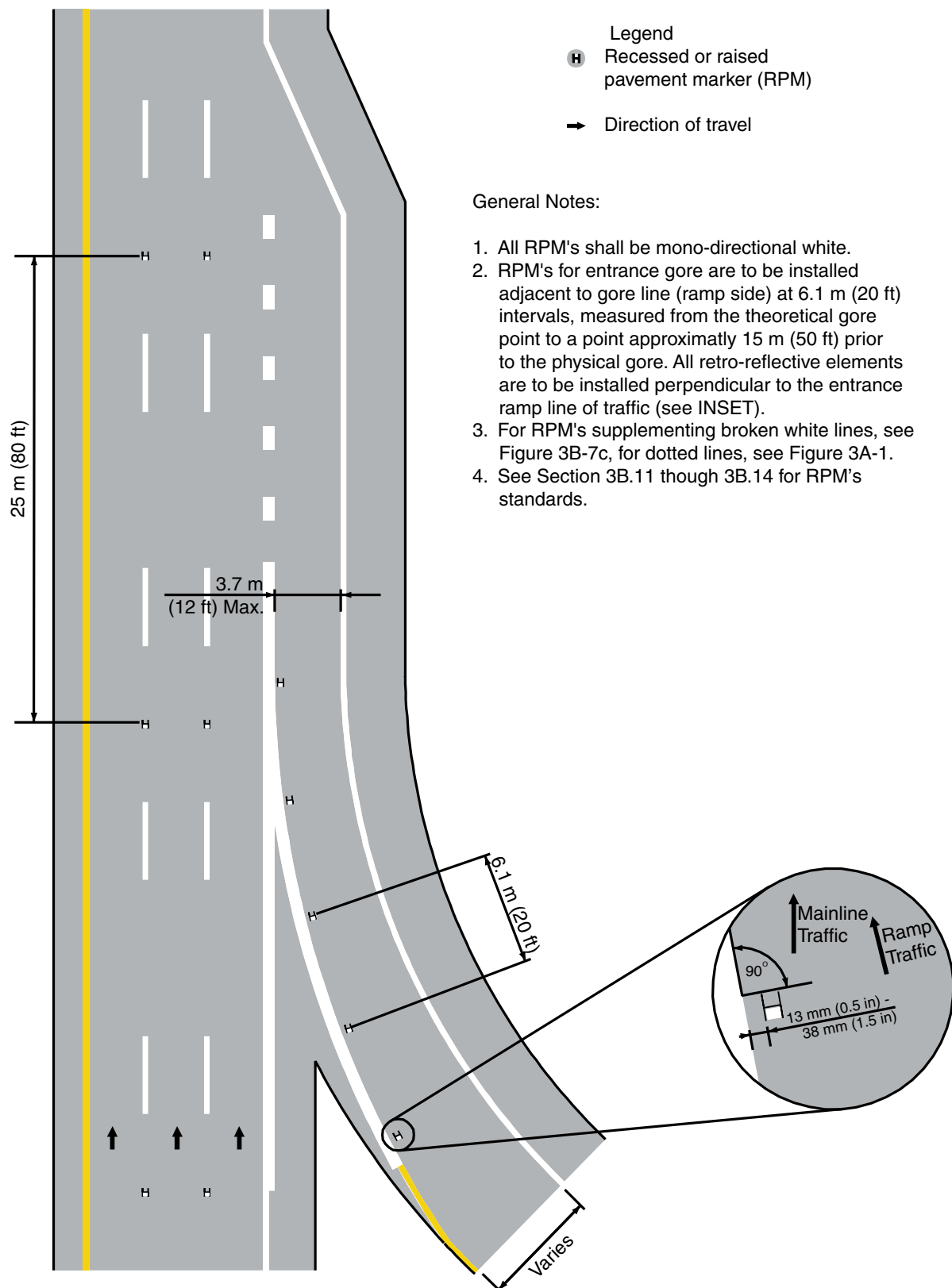


Figure 3B-9. Examples of Channelizing Line Applications for Entrance Ramp Markings (Sheet 2 of 4)



b - Parallel acceleration lane - Recessed or Raised Pavement Markers



c - Tapered acceleration lane

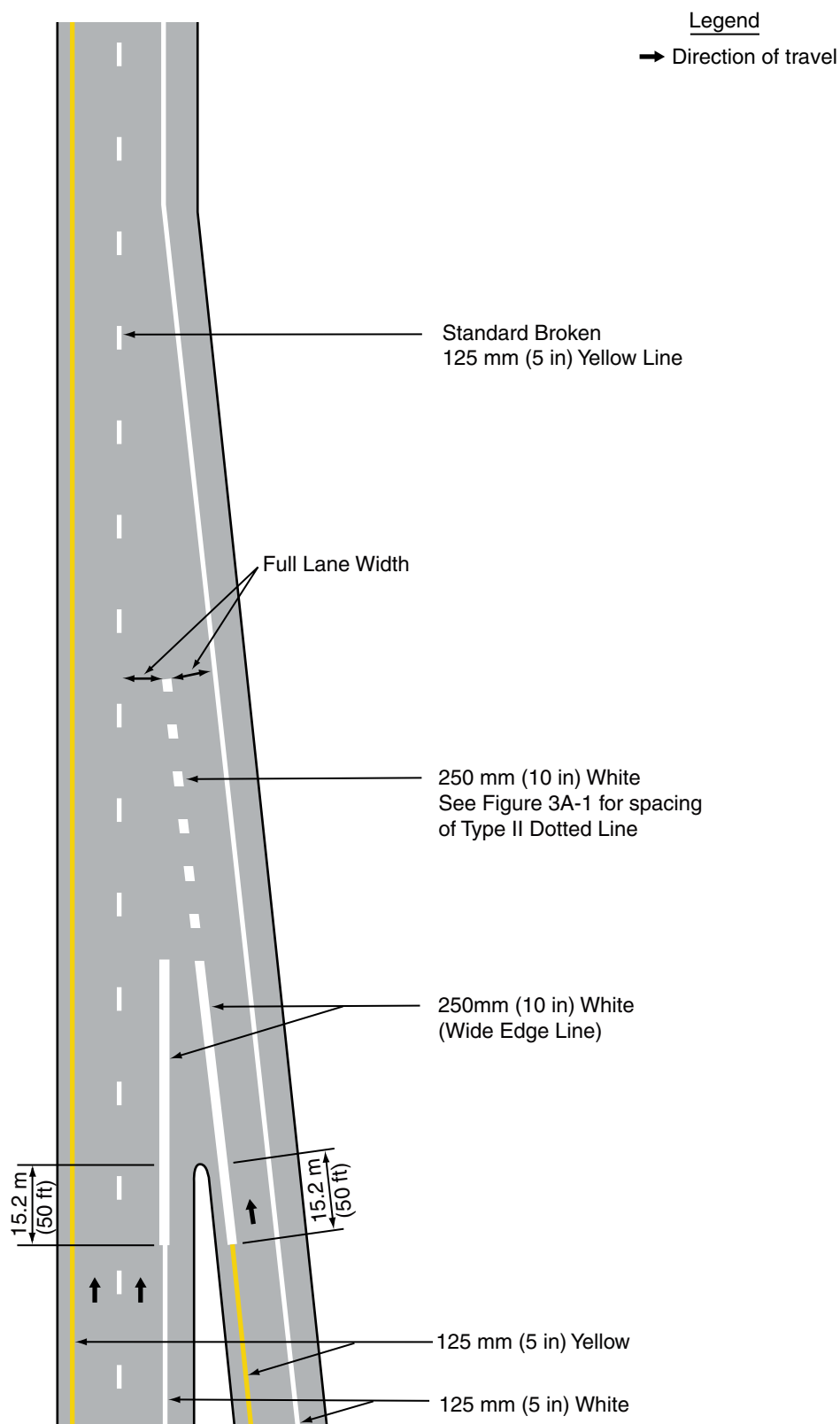


Figure 3B-9. Examples of Channelizing Line Applications for Entrance Ramp Markings (Sheet 4 of 4)



d - Tapered acceleration lane - Recessed or Raised Pavement Markers

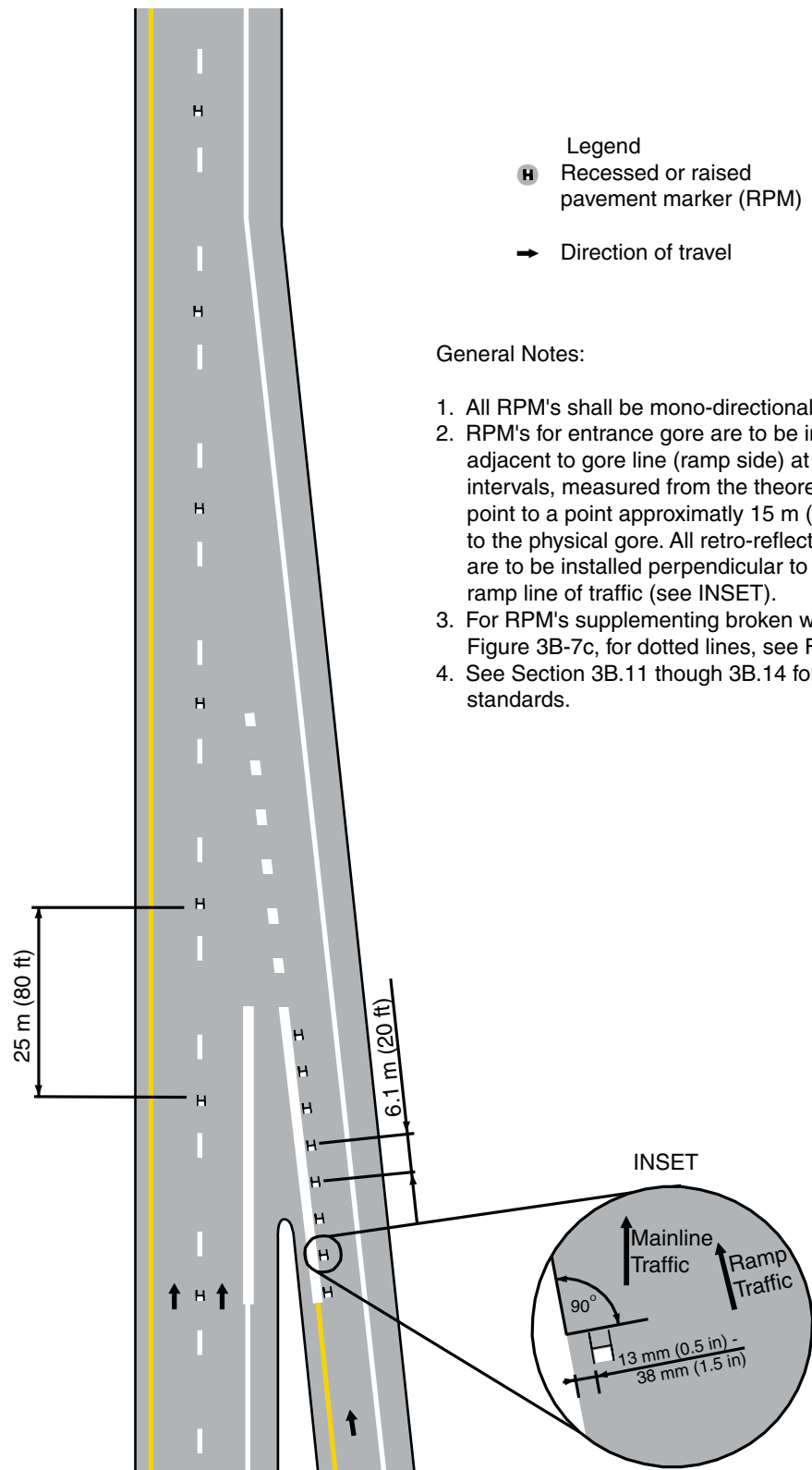


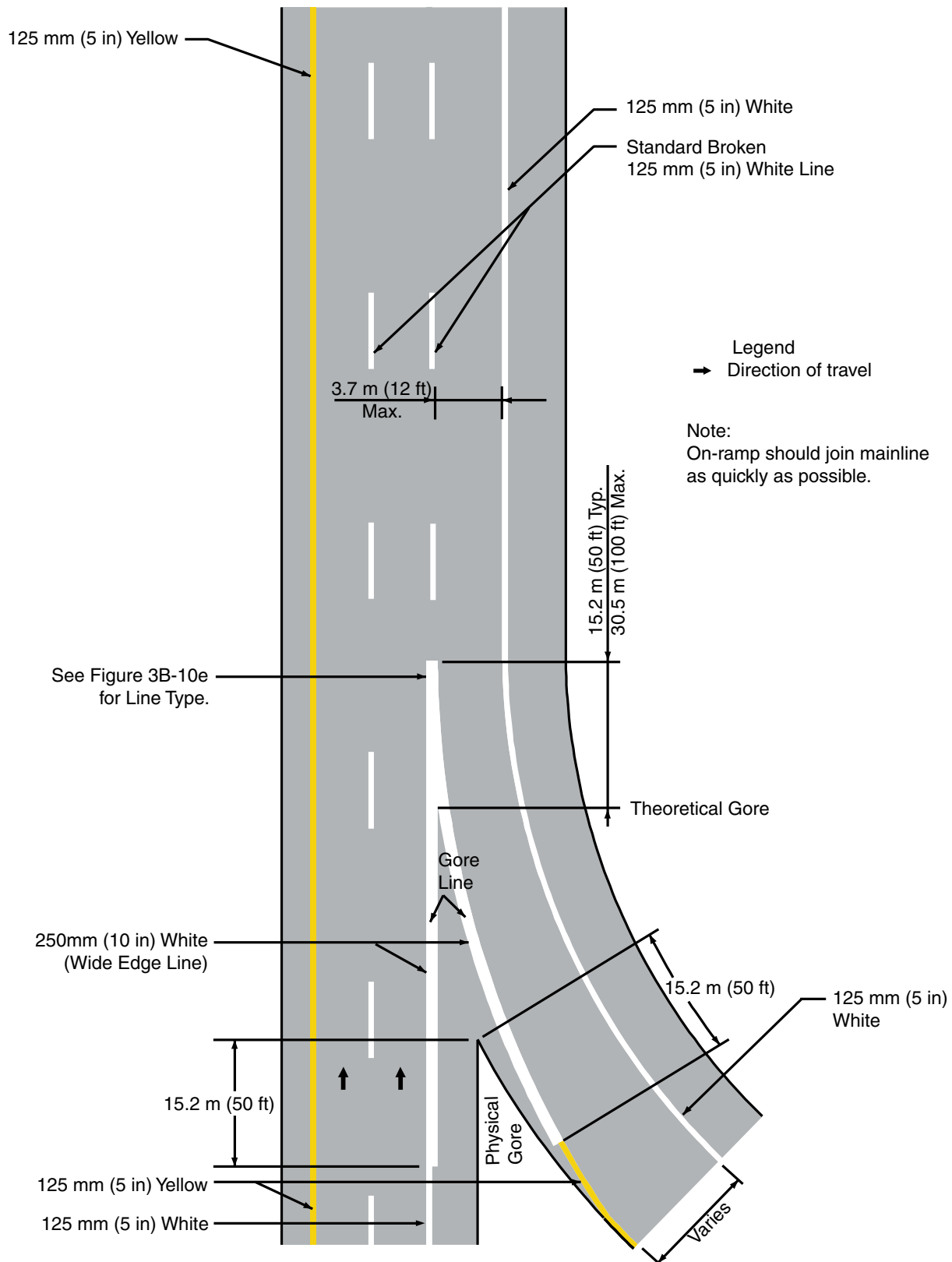
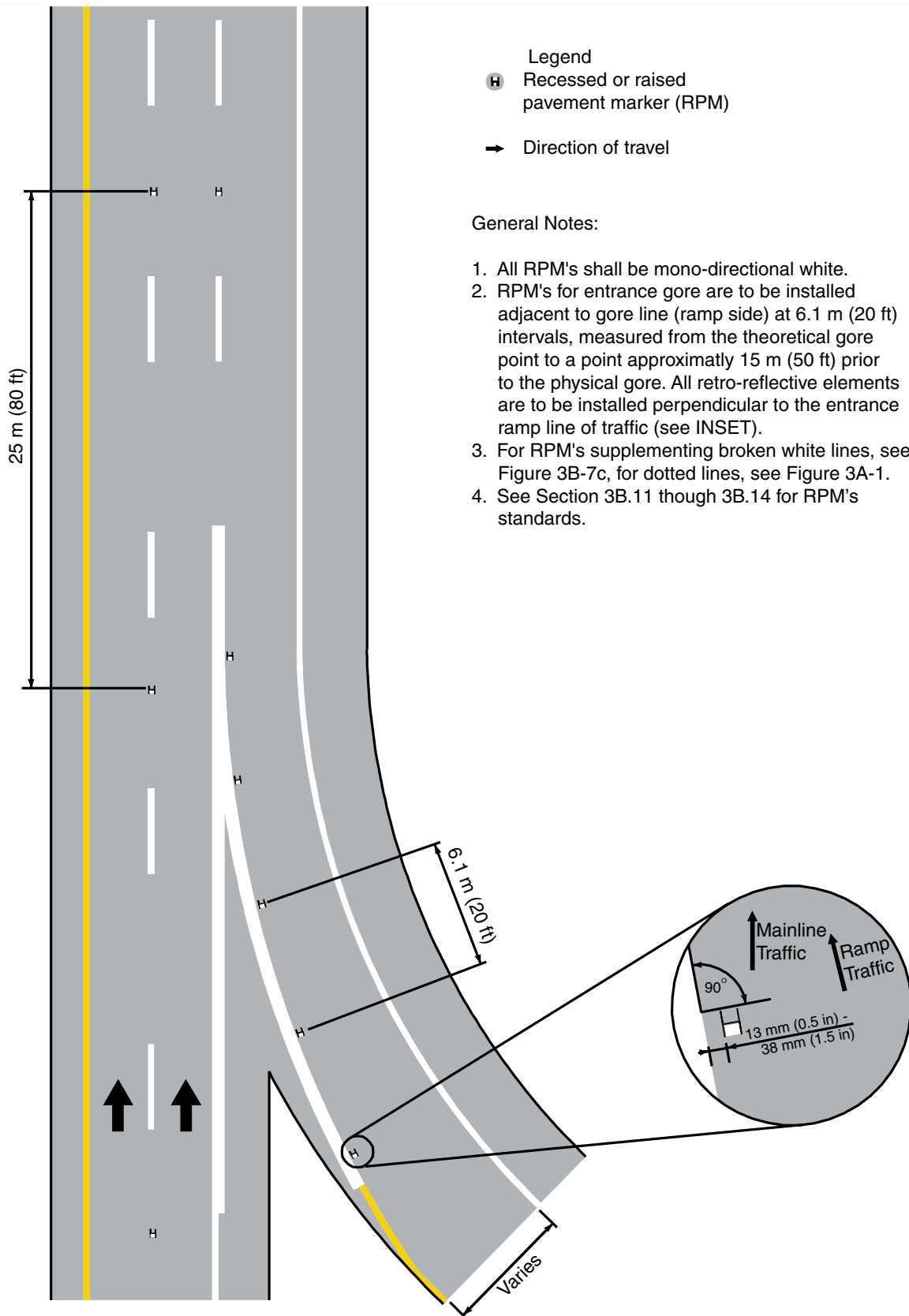
Figure 3B-9a. Examples of Interchange Ramps Marking - Free Access Lane. 

Figure 3B-9b. Examples of Interchange Ramps Marking - Free Access Lane - Recessed or Raised Pavement Markers.





**Figure 3B-9c. Examples of Interchange Ramps Marking
- Combination Accel-Decel Lane.**

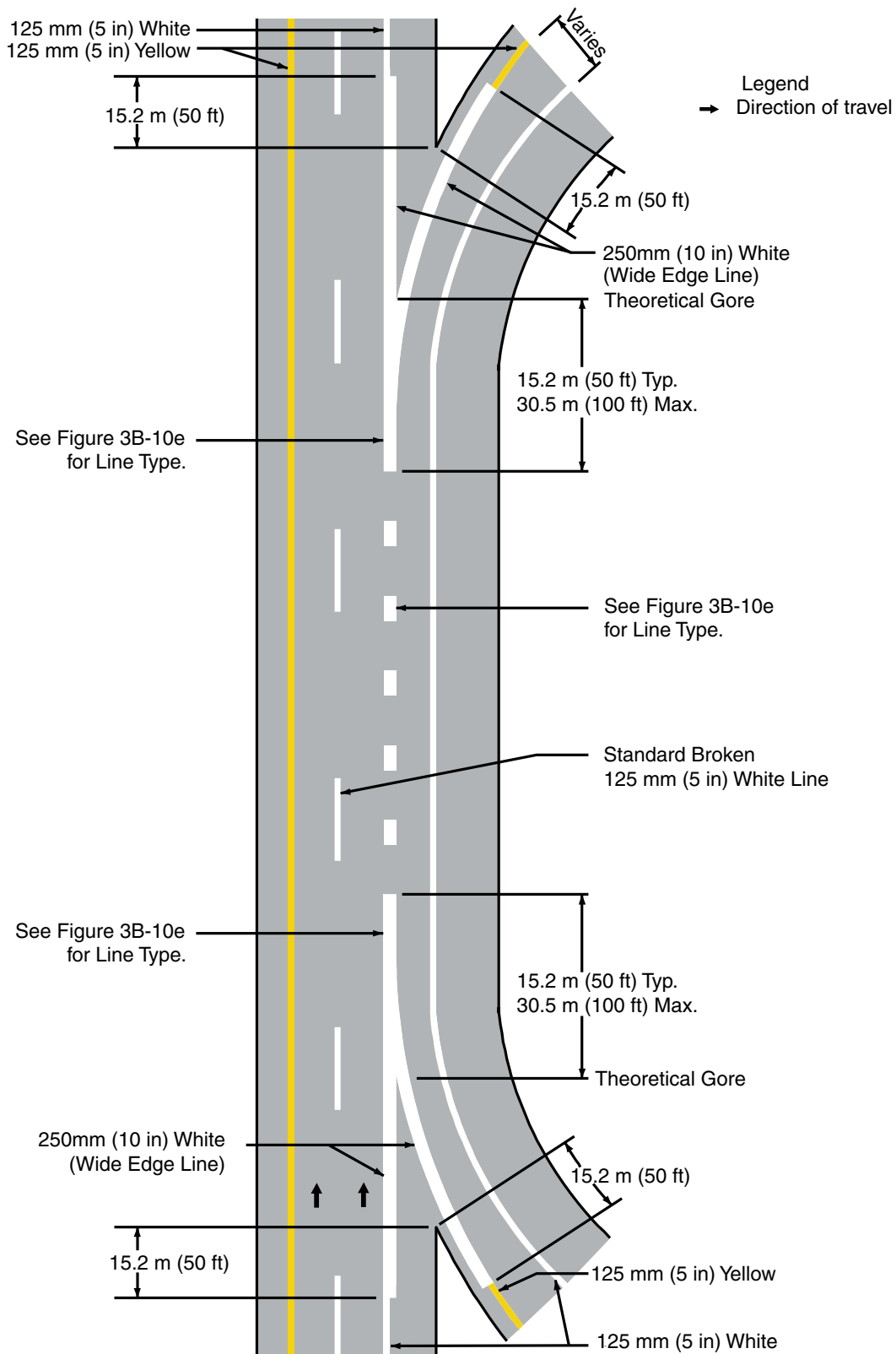
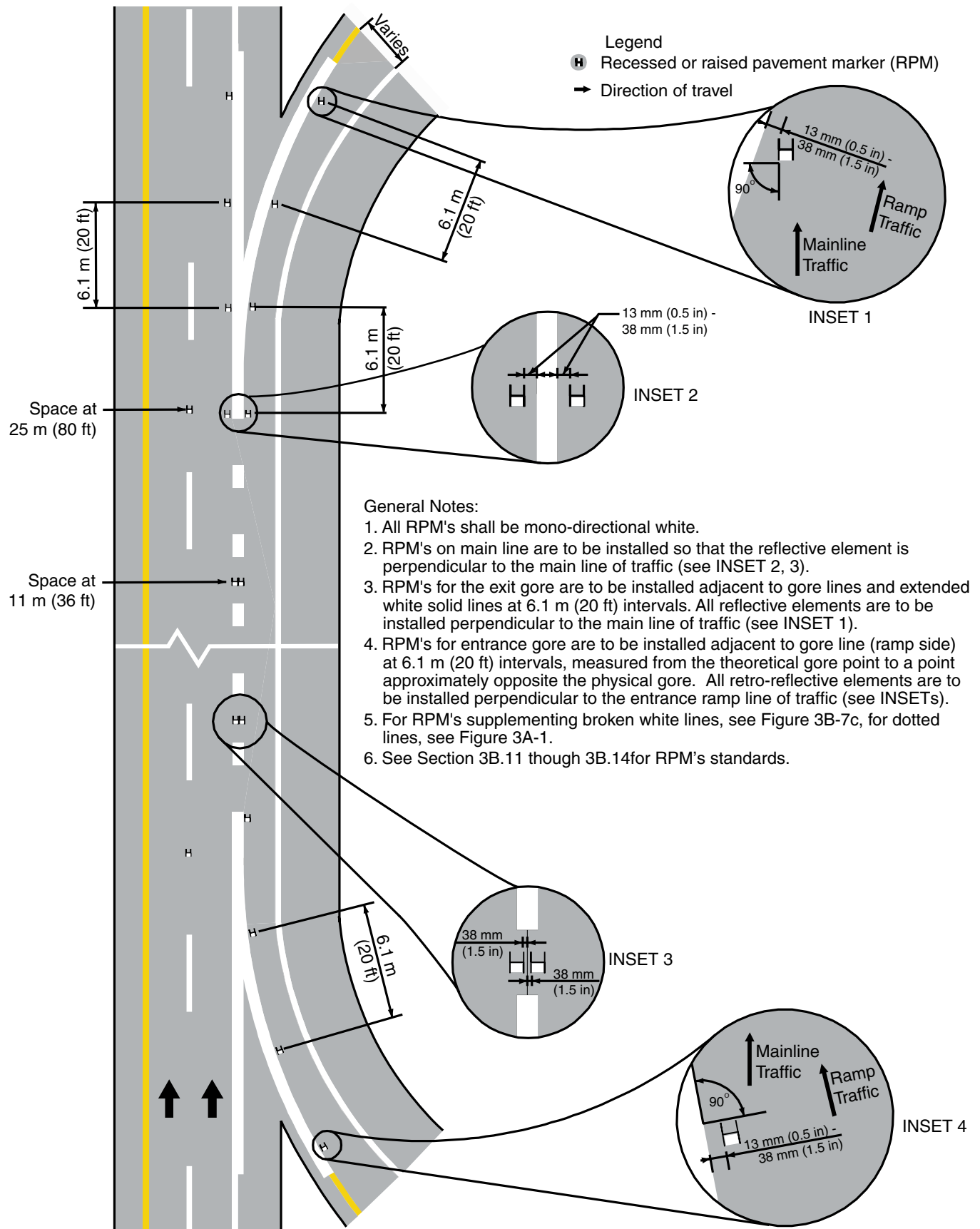
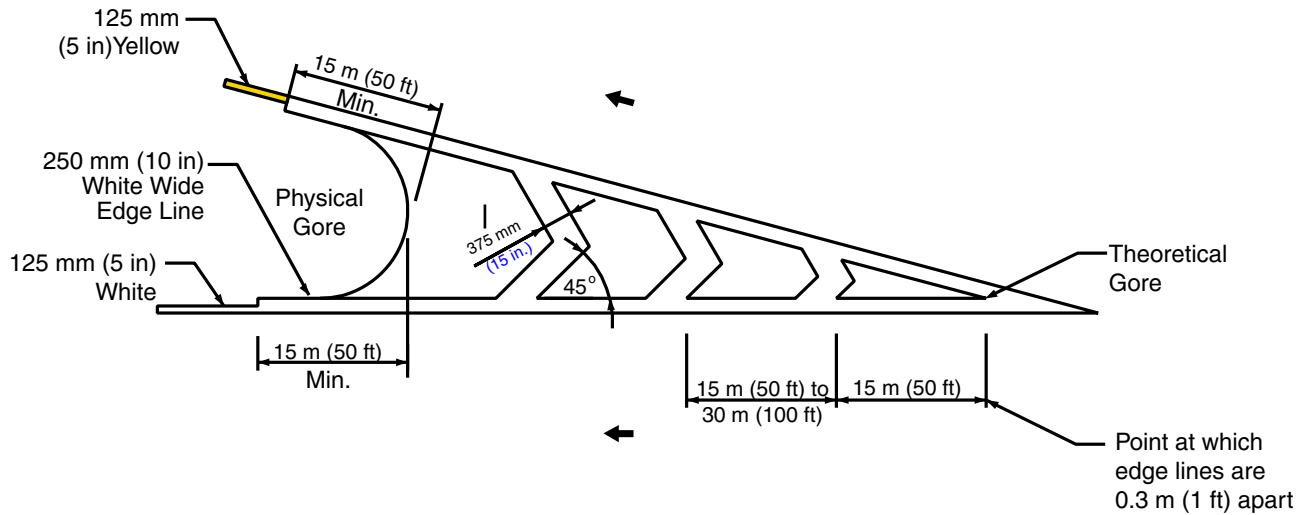


Figure 3B-9d. Examples of Interchange Ramps Marking - Combination Accel-Decel Lane - Recessed or Raised Pavement Markers.



**Figure 3B-9e. Examples of Channelizing Line
- Neutral Area Chevron Marking.**

a - Application for Exit Ramp



Notes:

Gore hatching may be applied to freeway gores for special emphasis.

When applied, the following shall be used:

- Cross hatching are 375 mm (15 in) wide with minimum space between hatches ranging from 15 m (50 ft) for blunt angle gores, up to 30 m (100 ft) for sharp angle gores.
- Recessed or raised pavement markers RPM's are to be set 13 mm (0.5 in) to 38 mm (1.5 in) outside lines and 50 mm (2 in) from construction joint.

b - Application for Entrance Ramp

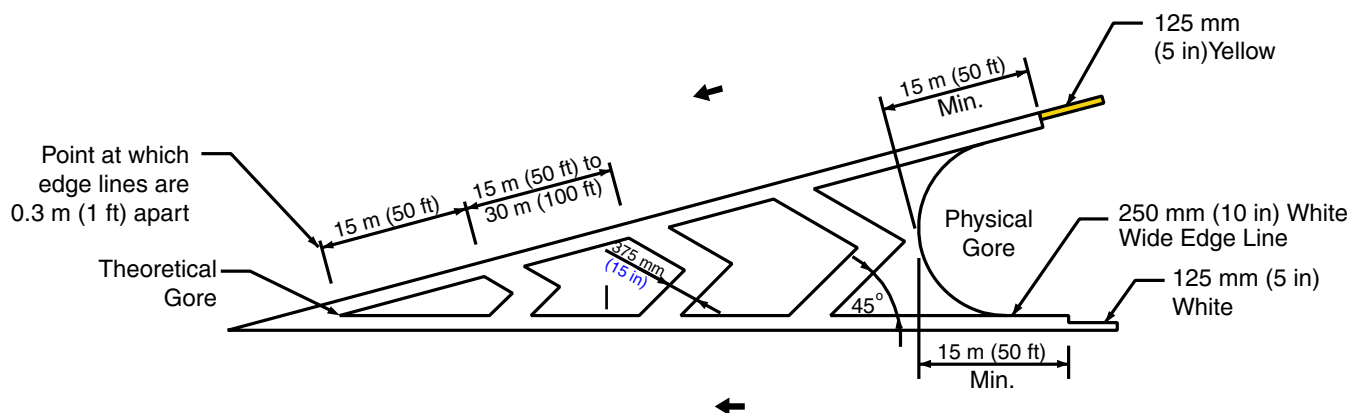


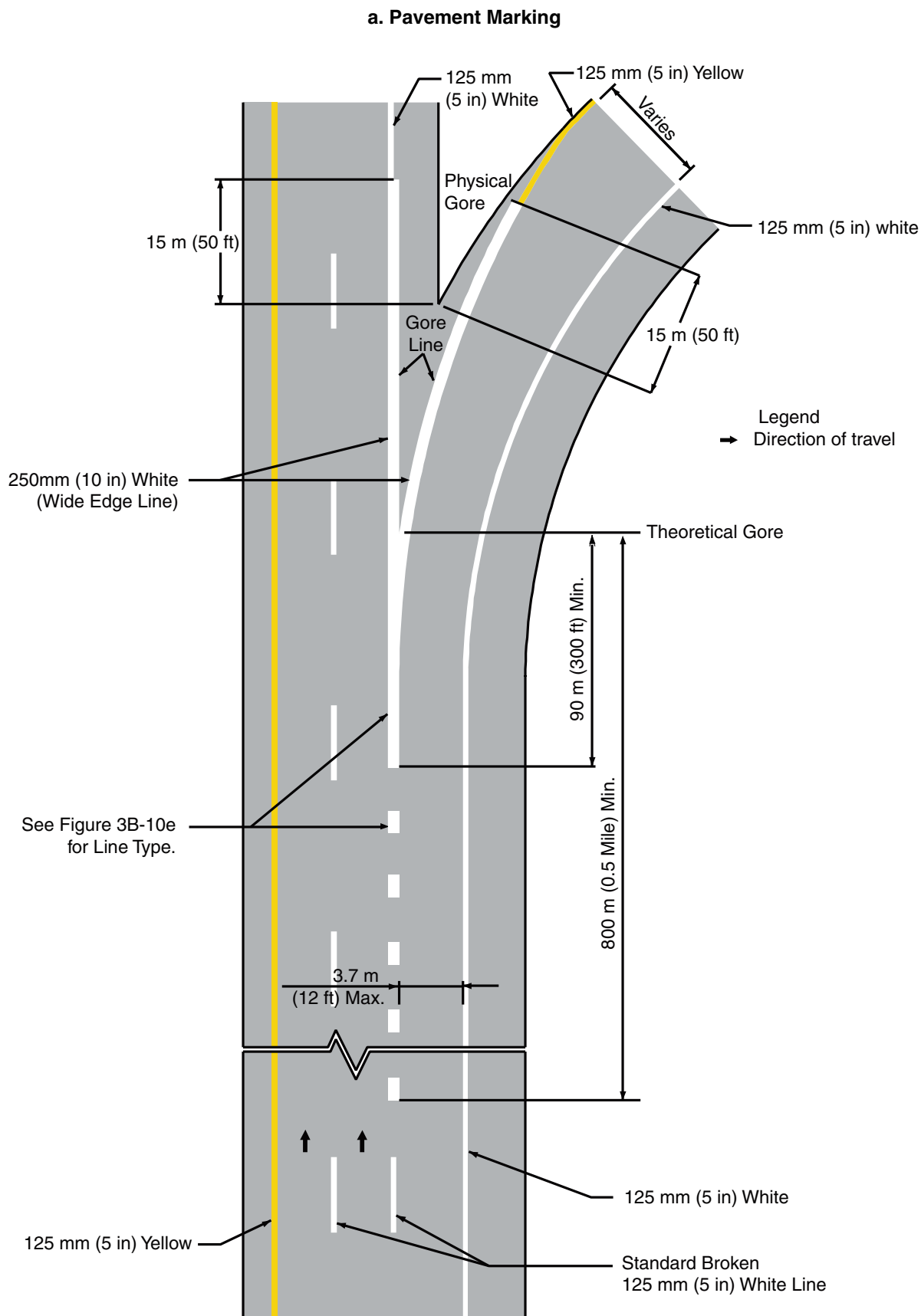
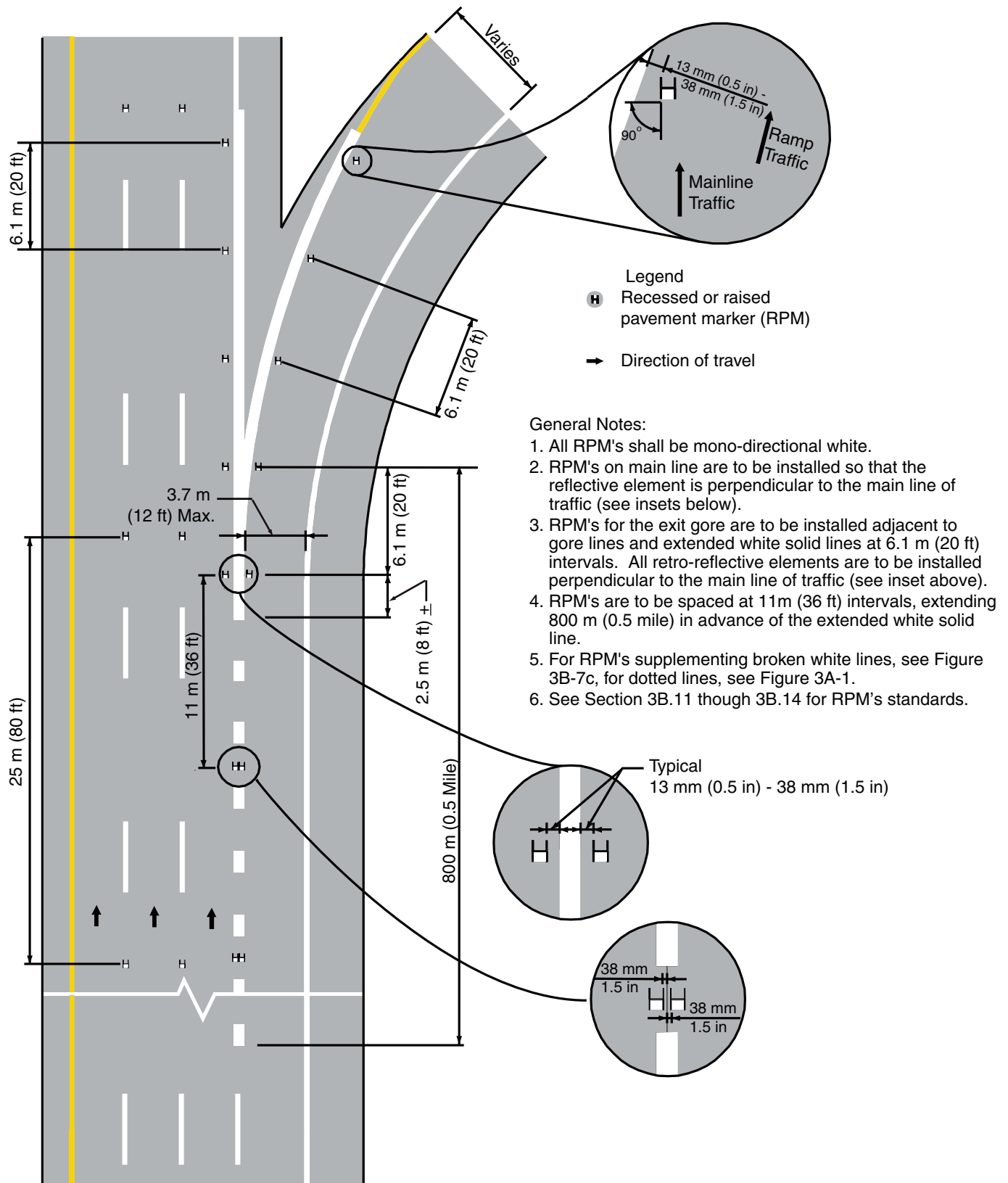
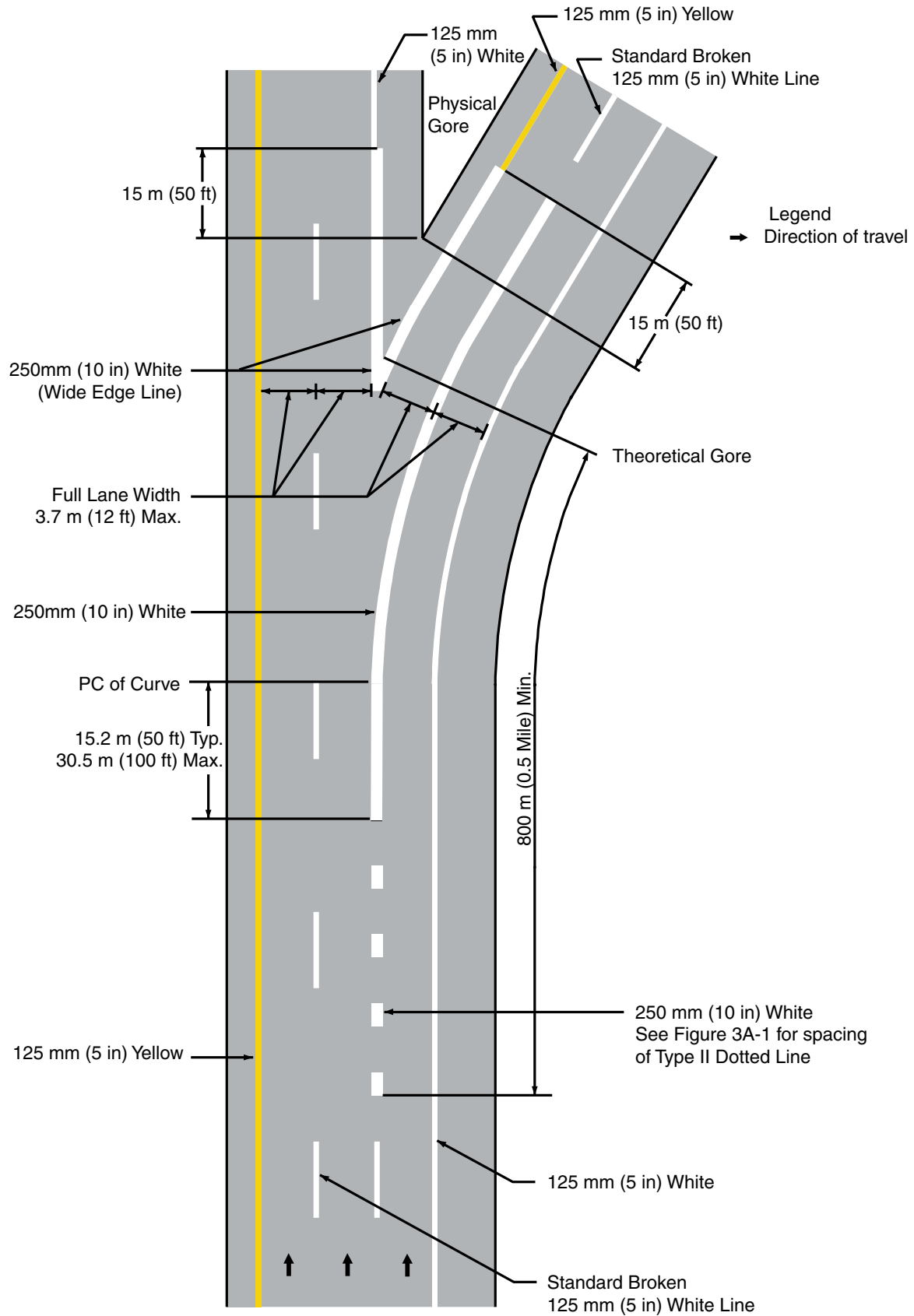
Figure 3B-10. Example of Lane Drop Markings at Exit Ramps (Sheet 1 of 2) 

Figure 3B-10. Example of Lane Drop Markings at Exit Ramps (Sheet 2 of 2)**b. Recessed or Raised Pavement Markers**

**Figure 3B-10a. Examples of Interchange Ramps Marking
- Combination Choice Lane/Lane Drop Exit.**



**Figure 3B-10b. Examples of Interchange Ramps Marking
(Combination Choice Lane/Lane Drop Exit)
- Recessed or Raised Pavement Markers.**

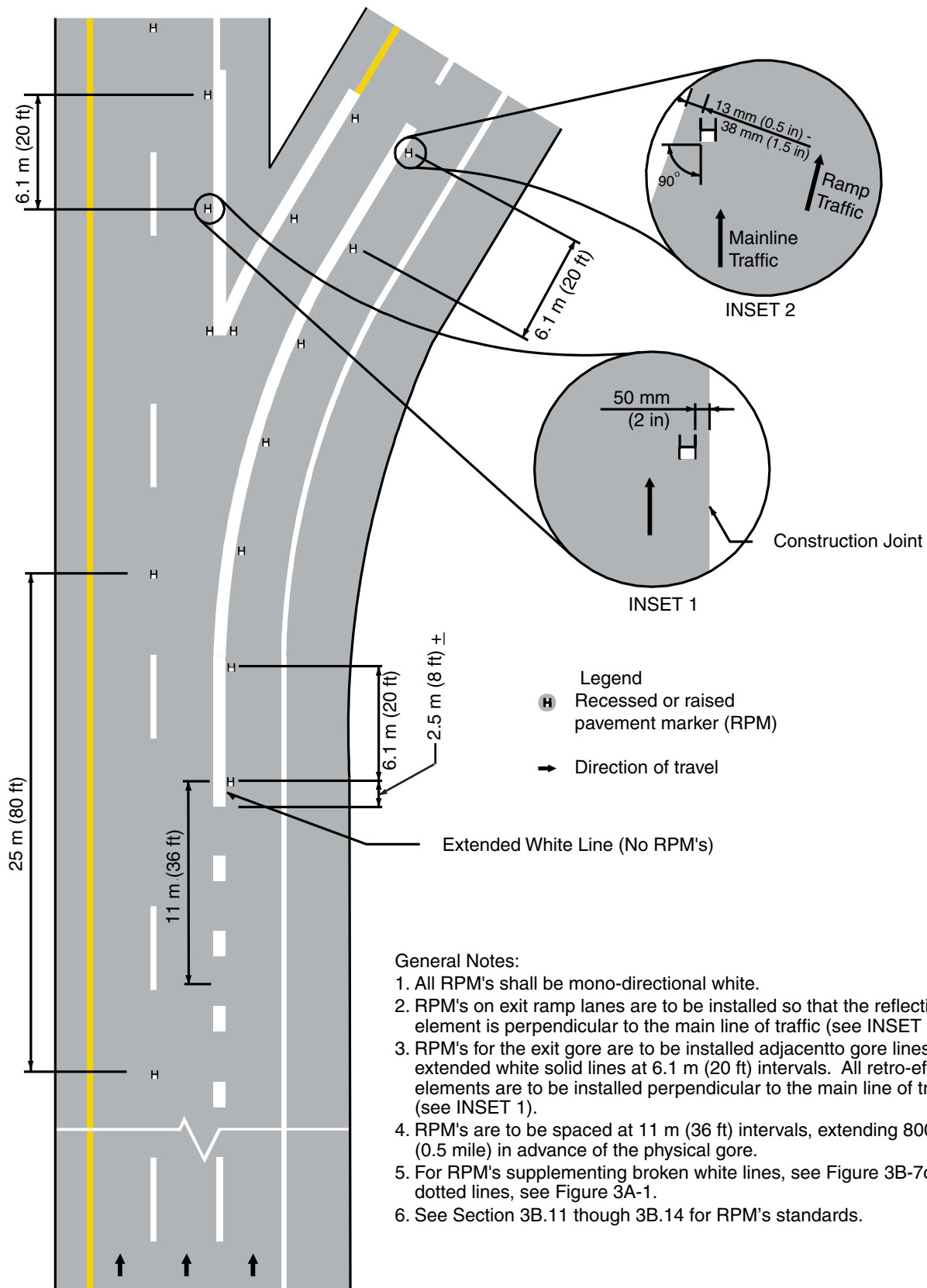


Figure 3B-10c. Examples of Interchange Ramps Pavement Marking - Bifurcation (Split).

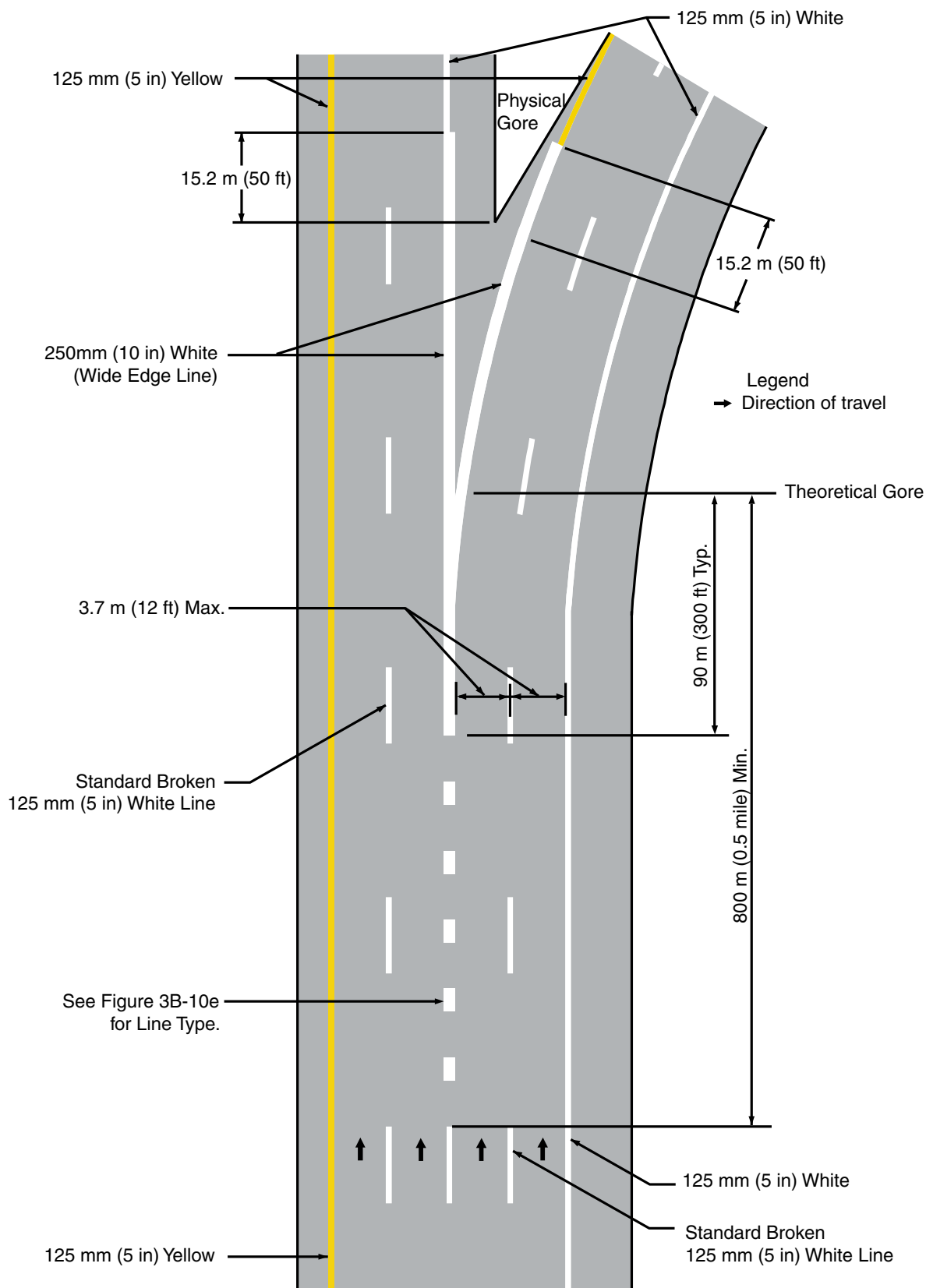


Figure 3B-10d. Examples of Interchange Ramps Marking - Bifurcation (Split) - Recessed or Raised Pavement Markers. 

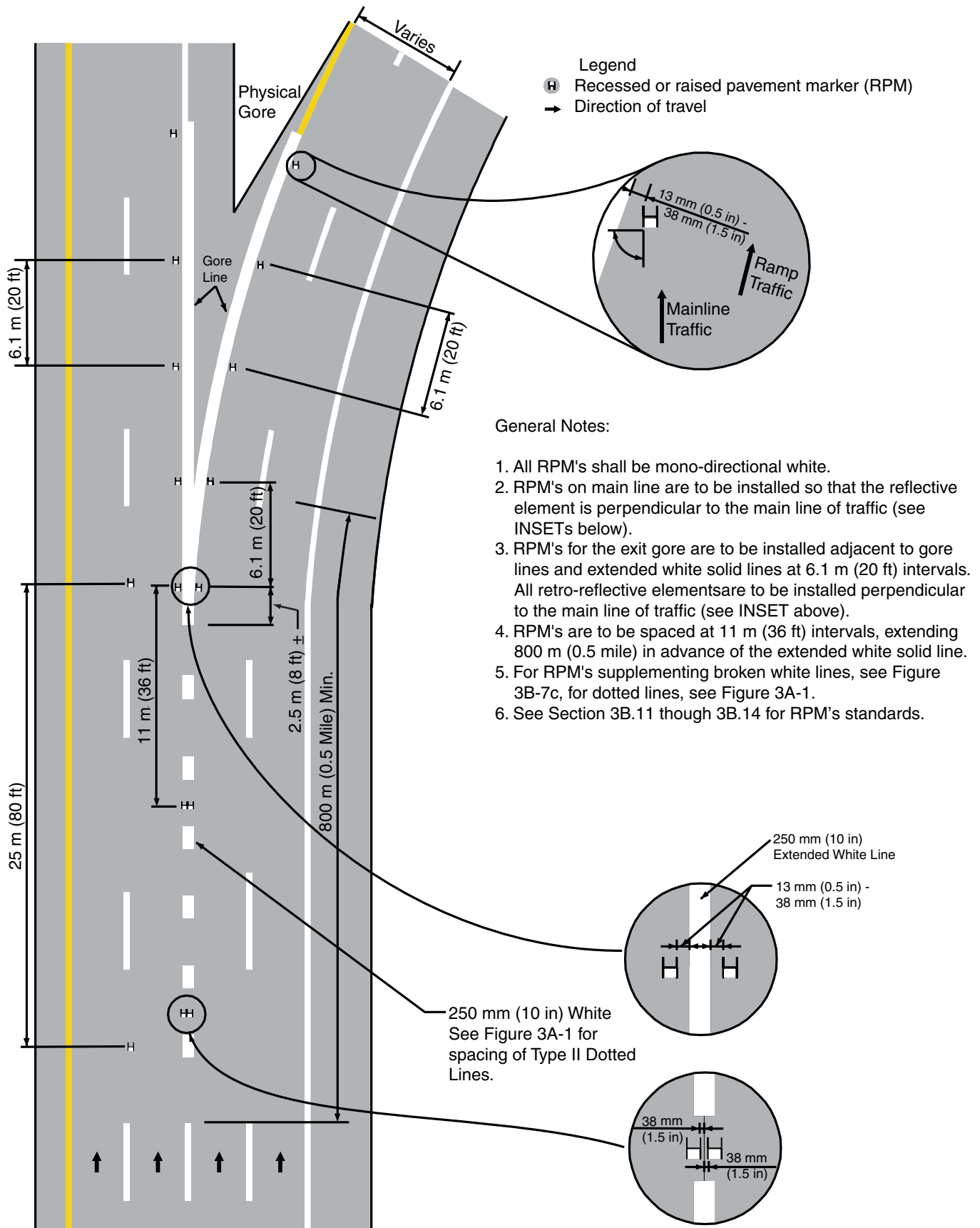
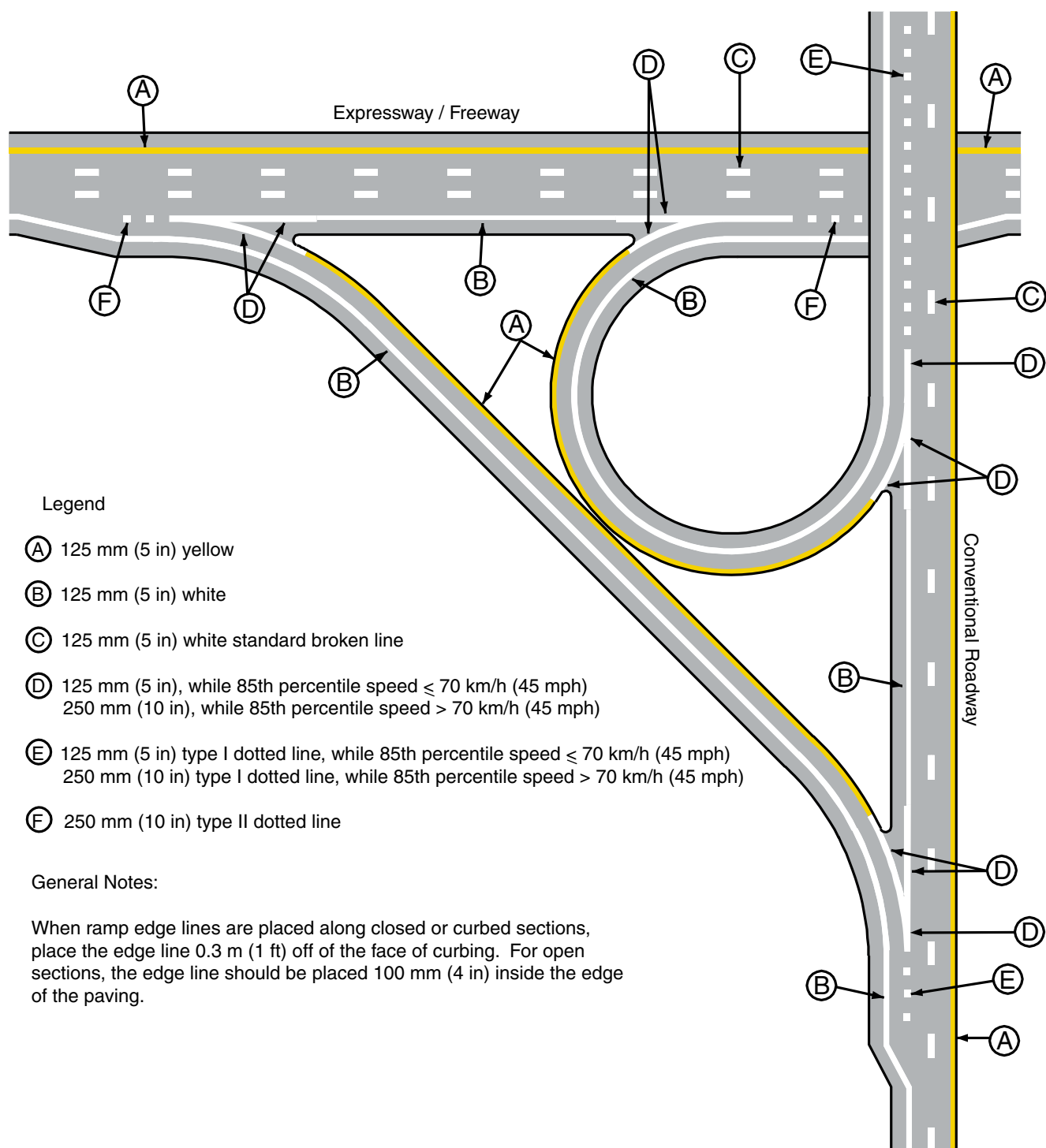


Figure 3B-10e. Examples of Expressway-Freeway and Conventional Roadway Lane Line Markings.



Section 3B.06 Edge Line Pavement Markings

Standard:

If used, edge line pavement markings shall delineate the right or left edges of a roadway.

Except for **Type III** dotted edge line extensions (see Section 3B.08), edge line markings shall not be continued through intersections or major driveways.

SHA

If used on the roadways of divided highways or one-way streets, or on any ramp in the direction of travel, left edge line pavement markings shall consist of a normal **125 mm (5 in)** solid yellow line to delineate the left edge of a roadway or to indicate driving or passing restrictions left of these markings.

SHA

If used, the right edge line pavement markings shall consist of a normal **125 mm (5 in)** solid white line to delineate the right edge of the roadway.

SHA

Guidance:

Edge line markings should not be broken for minor driveways.

Edge lines should not be placed on construction joints. Right lanes should be wider on a multi-lane roadway. The width of edge lines should be 125 mm (5 in) for conventional roadways, expressways and freeways.

SHA

Support:

Edge line markings have unique value as visual references to guide road users during adverse weather and visibility conditions.

Examples of interchange ramps pavement marking are shown in Figure 3B-8, Figure 3B-9, Figures 3B-9a through 3B-9d, Figure 3B-10, and Figures 3B-10a through 3B-10e.

SHA

Standard:

If used, wide edge lines shall be **250 mm (10 in)** wide and shall conform to Figure 3B-10f.

Where wide edge lines are installed on state highways, the Director of the Office of Traffic & Safety shall be notified.

Guidance:

Candidate sections - roadways with more than normal run-off-the-road accidents - should be actively sought, and appropriate records kept so that before and after accident studies can be conducted.

Option:

Wide edge lines may be used where accident patterns or potential safety problems suggest likely benefits.

Standard:

Edge lines shall be placed on both sides of all freeway and expressway ramps, whether curbed or not. In all cases where edge lines are placed on the left side of ramps, they shall be yellow between the end limits of the wide white gore channelizing markings (see Section 3B.05).

Guidance:

Where ramp edge lines are placed along closed or curbed sections, the edge line should be placed 300 mm (12 in) off the face of the curb as so not to be obliterated by dirt or debris in the gutter channel. When edge lines are placed along open or non-curbed sections, the edge line should be placed 100 mm (4 in) inside the edge of the paving.

Option:

If the ramp has an outside shoulder, the edge line may be placed at the break point instead of 100 mm (4 in) from the edge of the pavement.

Section 3B.07 Warrants for Use of Edge Lines

Standard:

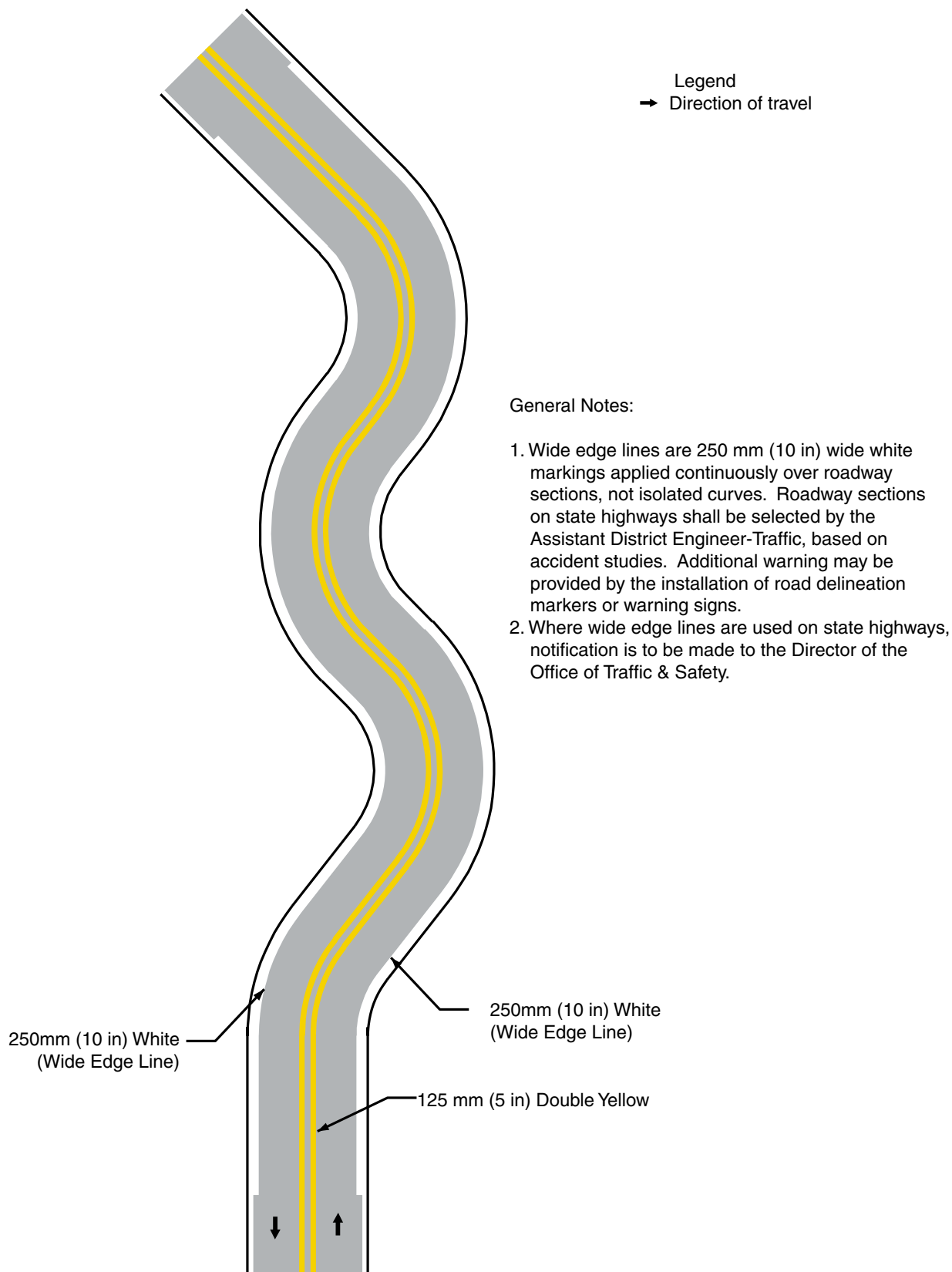
Edge line markings shall be placed on paved streets or highways with the following characteristics:

- A. Freeways;
- B. Expressways; and
- C. Rural arterials with a traveled way of 6.1 m (20 ft) or more in width and an ADT of 6,000 vehicles per day or greater.

Guidance:

Edge line markings should be placed on paved streets or highways with the following characteristics:

- A. Rural arterials and collectors with a traveled way of 6.1 m (20 ft) or more in width and an ADT of 3,000 vehicles per day or greater.

Figure 3B-10f. Examples of Wide Edge Lines

B. At other paved streets and highways where an engineering study indicates a need for edge line markings.

Edge line markings should not be placed where an engineering study or engineering judgment indicates that providing them is likely to decrease safety.

Option:

Edge line markings may be placed on streets and highways with or without centerline markings.

Edge line markings may be excluded, based on engineering judgment, for reasons such as if the traveled way edges are delineated by curbs, parking, bicycle lanes, or other markings.

Edge line markings may be used where edge delineation is desirable to minimize unnecessary driving on paved shoulders or on refuge areas that have lesser structural pavement strength than the adjacent roadway.

Section 3B.08 Extensions Through Intersections or Interchanges

Standard:

Pavement markings extended into or continued through an intersection or interchange area shall be the same color and at least the same width as the line markings they extend (see Figure 3B-11).

Support:

The “Guideline for Using Edge Line Extensions and Yield Lines” contains further information regarding markings for edge line extensions and yield lines. This document can be obtained from the Maryland State Highway Administration’s Office of Traffic & Safety, Traffic Development & Support Division (TDSD) at the address shown on Page i.



Option:

A normal line may be used to extend a wide line through an intersection.

Guidance:

Where highway design or reduced visibility conditions make it desirable to provide control or to guide vehicles through an intersection or interchange, such as at offset, skewed, complex, or multilegged intersections, on curved roadways, or where multiple turn lanes are used, dotted line markings should be used to extend longitudinal line markings through an intersection or interchange area.

Option:

Dotted edge line extensions may be placed through intersections or major driveways.

Guidance:

Where greater restriction is required, solid lane lines or channelizing lines should be extended into or continued through intersections or major driveways. However, edge lines should not be extended into or continued through intersections or major driveways as solid lines.

A single line of equal width to one of the lines of the double line should be used to extend a double line through an intersection.

To the extent possible, pavement marking extensions through intersections should be designed in a manner that minimizes potential confusion for drivers in adjacent or opposing lanes.

Section 3B.09 Lane Reduction Transition Markings

Standard:

Where pavement markings are used, lane reduction transition markings shall be used to guide traffic through transition areas where the number of through lanes is reduced, as shown in Figures 3B-12, 3B-12a, and 3B-12b. On two-way roadways, no-passing zone markings shall be used to prohibit passing in the direction of the convergence, and shall continue through the transition area.




If used, the details and placement of the lane reduction transition arrow shall conform to Figures 3B-12c and 3B-12d.



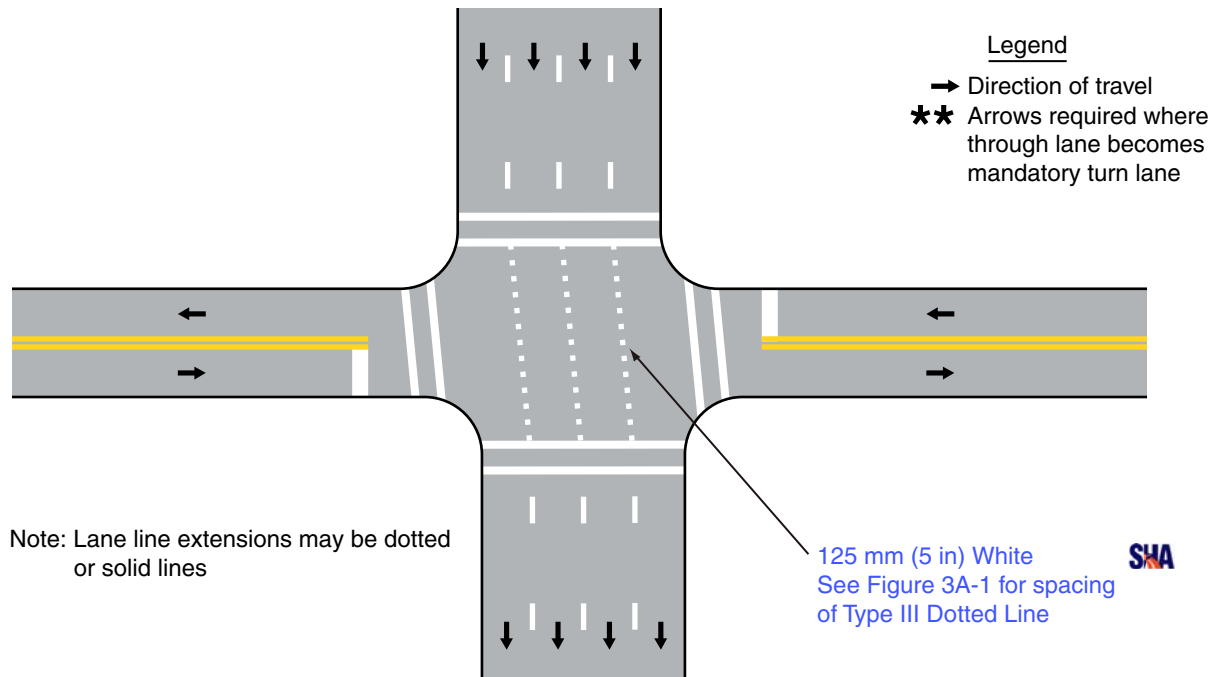
Guidance:

For roadways having a posted or statutory speed limit of 70 km/h (45 mph) or greater, the transition taper length for a lane reduction should be computed by the formula $L = 0.62 WS$ for speeds in km/h ($L = WS$ for speeds in mph). For roadways where the posted or statutory speed limit is less than 70 km/h (45 mph), the formula $L = WS/155$ for speeds in km/h ($L = WS/60$ for speeds in mph) should be used to compute taper length. Under both formulas, L equals the taper length in meters (feet), W equals the width of the offset distance in meters (feet), and S equals the 85th-percentile speed or the posted or statutory speed limit, whichever is higher.

Where observed speeds exceed posted or statutory speed limits, longer tapers should be used.

Figure 3B-11. Examples of Extensions through Intersections (Sheet 1 of 4) 

a - Typical pavement markings with offset lane lines continued through the intersection and optional crosswalk lines and stop lines



b - Typical pavement markings with optional double-turn lane lines, lane-use turn arrows, crosswalk lines, and stop lines

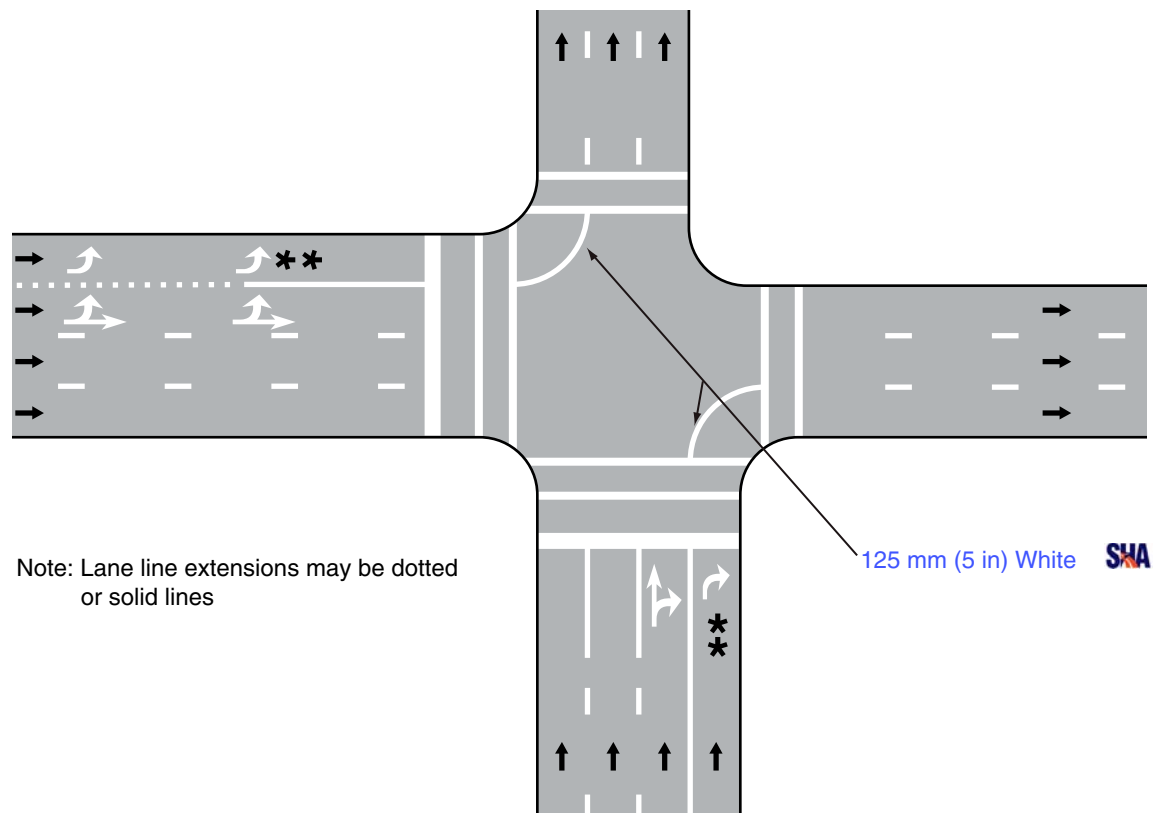
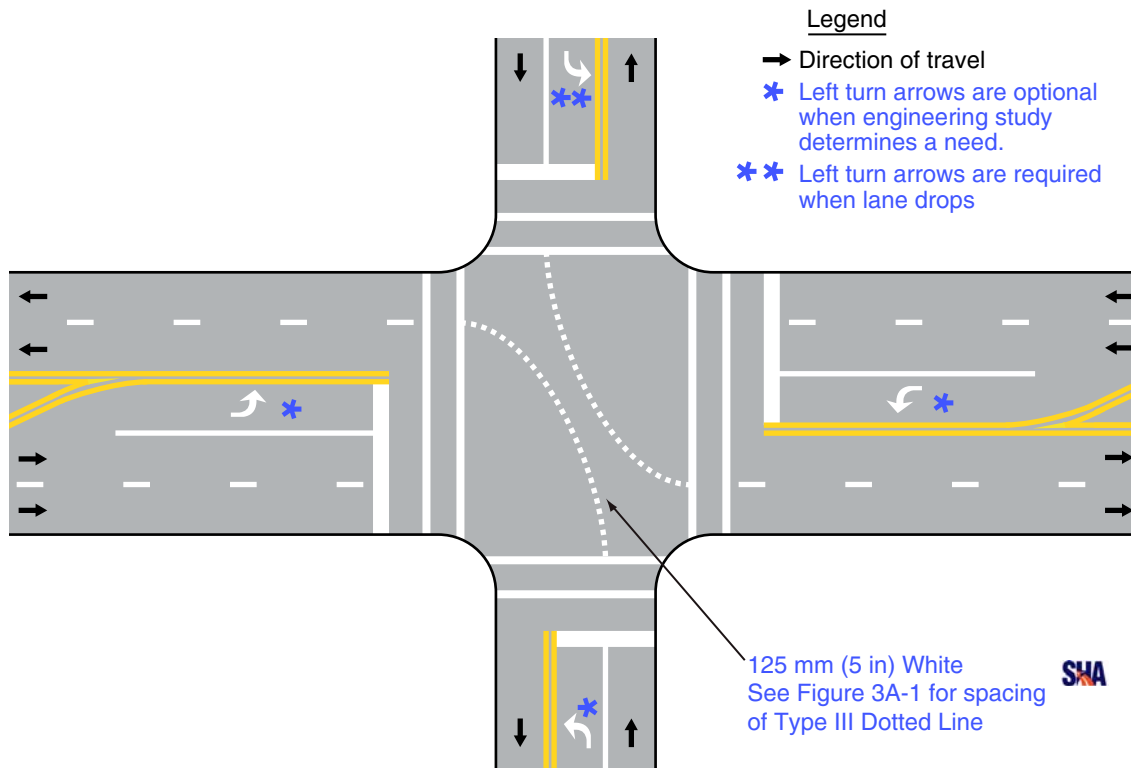


Figure 3B-11. Examples of Extensions through Intersections (Sheet 2 of 4) **SHA**

c - Typical dotted line markings to extend longitudinal lane line markings **SHA**



d - Typical dotted line markings to extend longitudinal centerline markings

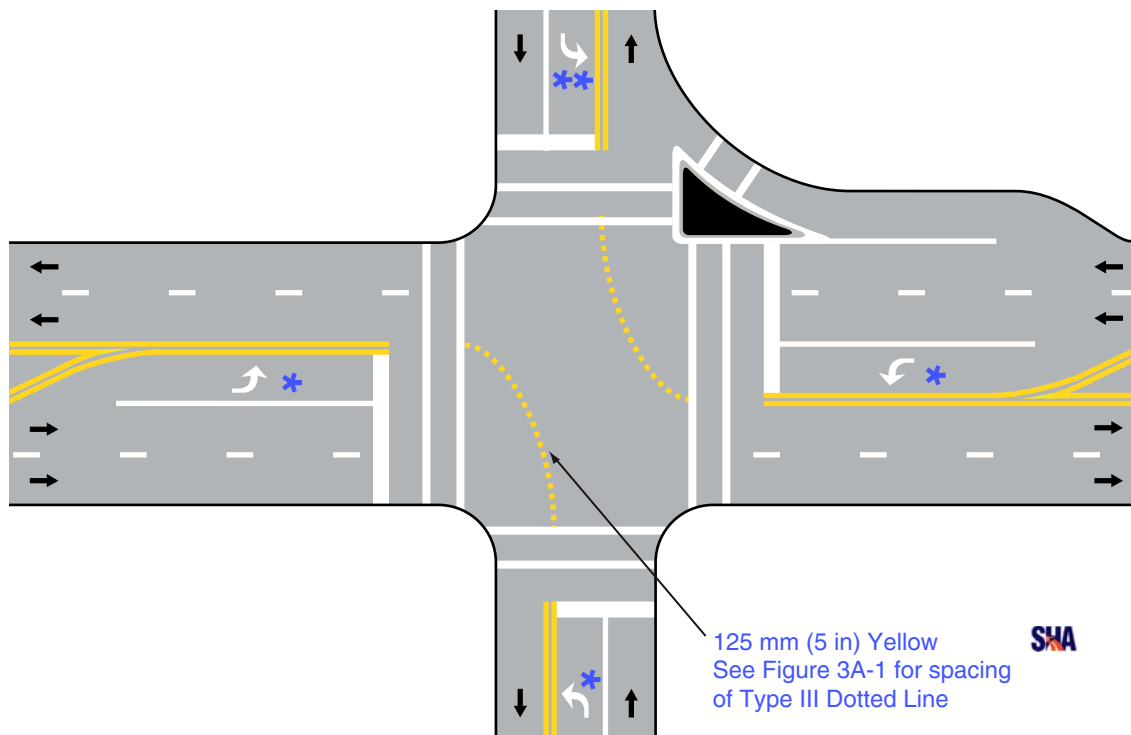


Figure 3B-11. Examples of Extensions through Intersections (Sheet 3 of 4) **SHA**

e - Typical dotted line markings to extend longitudinal lane line markings - with Median

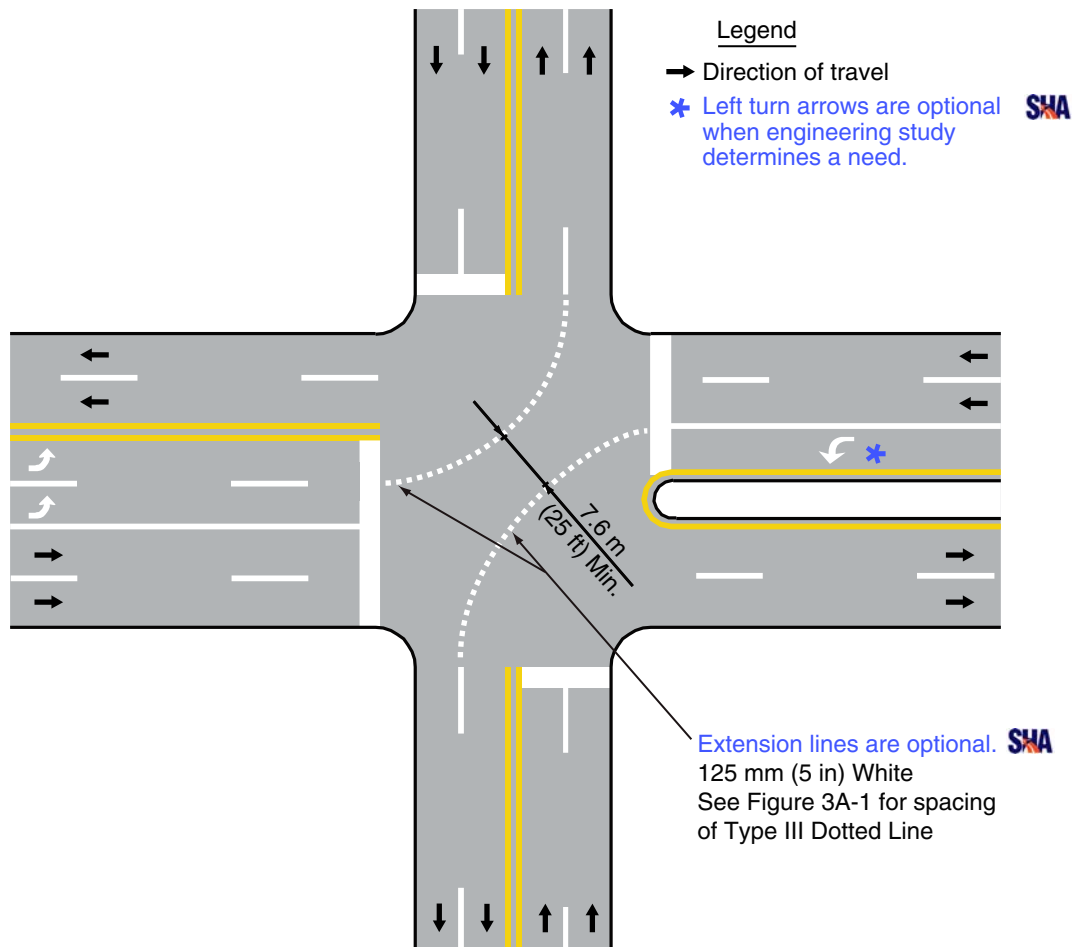


Figure 3B-11. Examples of Extension through Intersections (Sheet 4 of 4)

f - Typical pavement markings with offset center line and lane lines continued through the intersection, double-turn lane lines, lane-use turn arrows, crosswalk lines, and stop lines

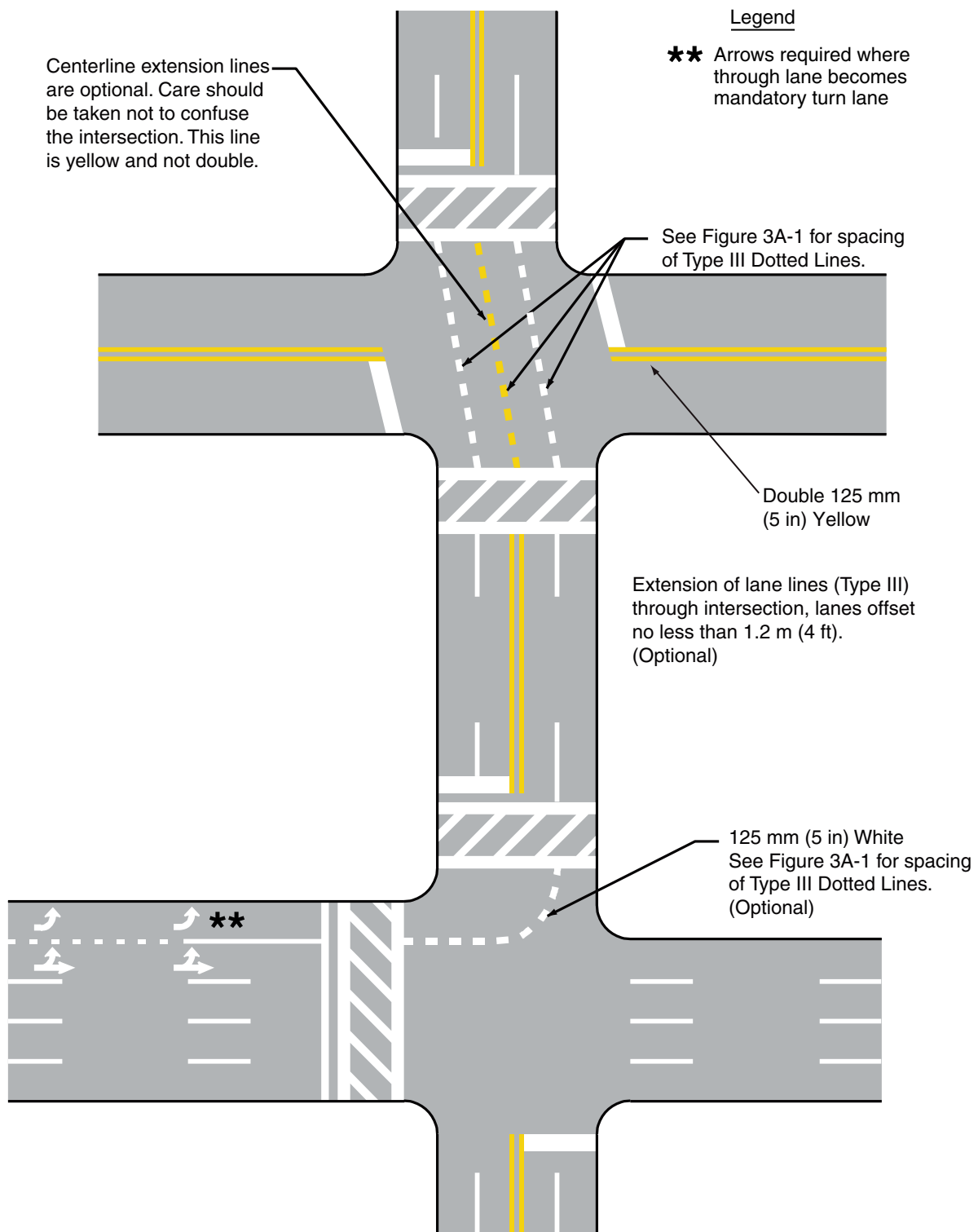
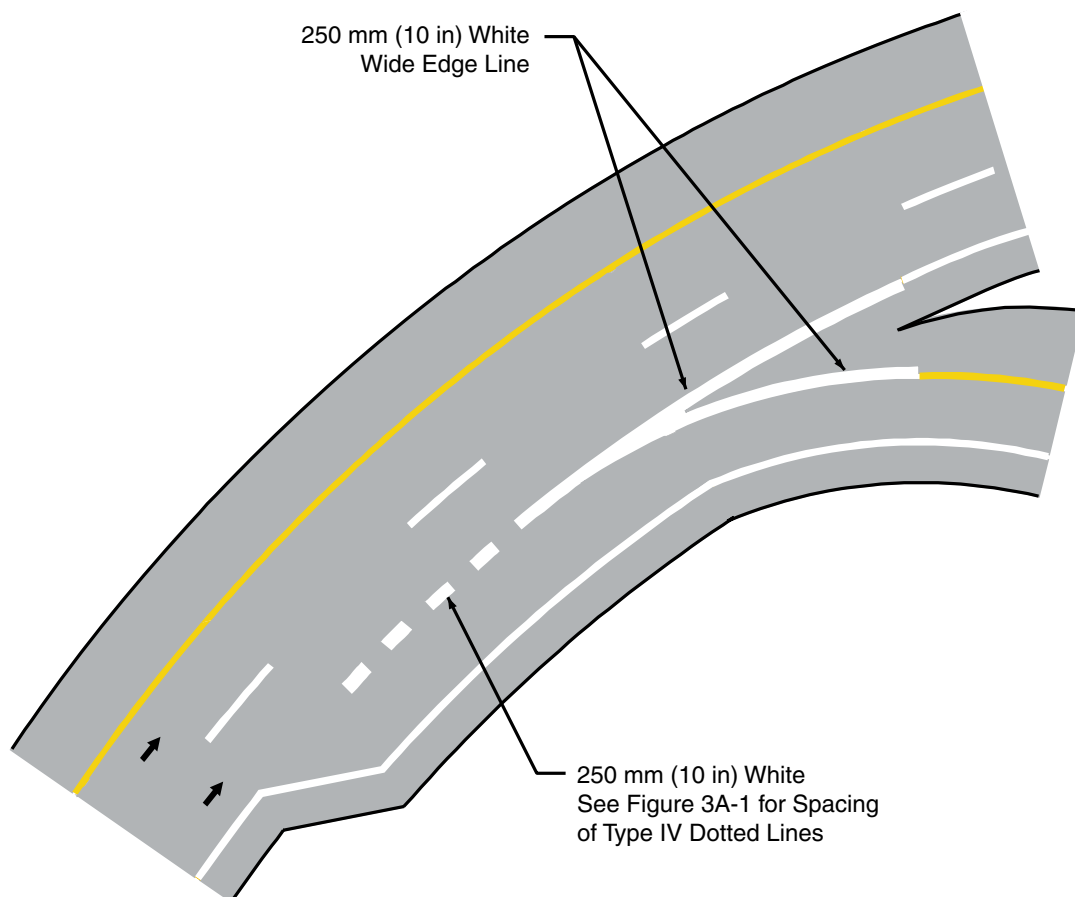
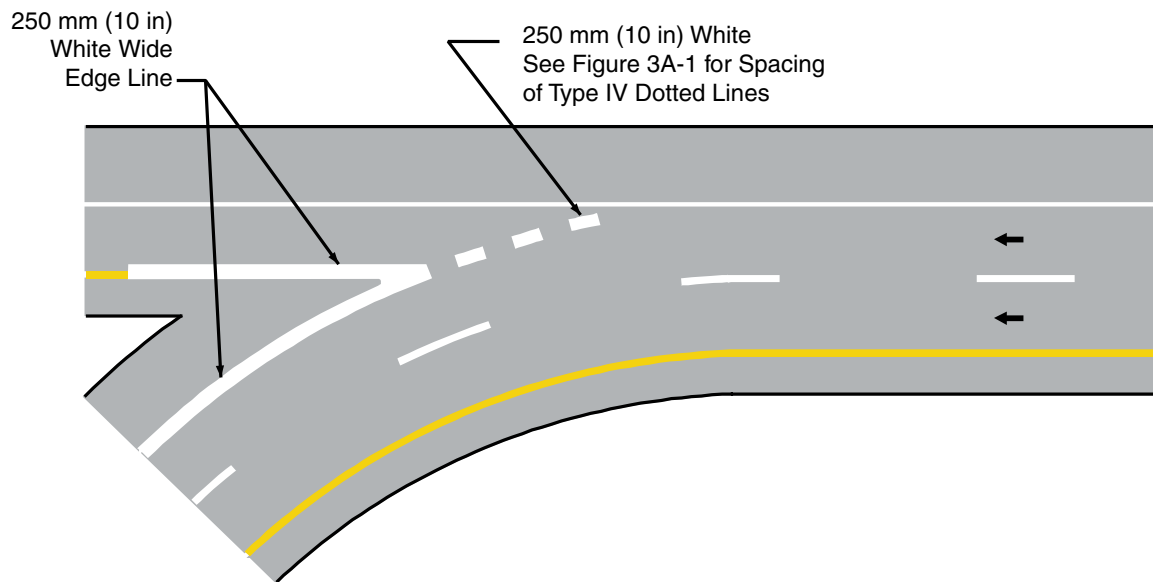


Figure 3B-11a. Examples of Extensions for Expressways / Freeways



Option:

On new construction, where no posted or statutory speed limit is established, the design speed may be used in the transition taper length formula.

Guidance:

Lane line markings should be discontinued one-quarter of the distance between the Lane Ends sign (see Section 2C.33) and the point where the transition taper begins.

For undivided multi-lane arterials, lane line markings should be discontinued one third of the distance from the first Lane Ends sign and the point where the transition taper begins (see Figure 3B-12).



For freeway and expressways, Type II dotted line markings should be extended from half of the distance from the first Lane Ends sign and the point where the transition taper begins to the beginning of transition (See Figure 3B-12a).

Edge line markings should be installed from the location of the warning sign to beyond the beginning of the narrower roadway.

Support:

Pavement markings at lane reduction transitions supplement the standardsigns.

Section 3B.10 Approach Markings for Obstructions**Standard:**

Pavement markings shall be used to guide traffic away from fixed obstructions within a paved roadway. Approach markings for bridge supports, refuge islands, median islands, and raised channelization islands shall consist of a tapered line or lines extending from the centerline or the lane line to a point 0.3 to 0.6m (1 to 2 ft) to the right side, or to both sides, of the approach end of the obstruction (see Figure 3B-13).

Guidance:

For roadways having a posted or statutory speed limit of 70 km/h (45 mph) or greater, the taper length of the tapered line markings should be computed by the formula $L = 0.62 WS$ for speeds in km/h ($L = WS$ for speeds in mph). For roadways where the posted or statutory speed limit is less than 70 km/h (45 mph), the formula $L = WS^2/155$ for speeds in km/h ($L = WS^2/60$ for speeds in mph) should be used to compute taper length. Under both formulas, L equals the taper length in meters (feet), W equals the width of the offset distance in meters (feet), and S equals the 85th-percentile speed or the posted or statutory speed limit, whichever is higher.

Standard:

The minimum taper length shall be 30 m (100 ft) in urban areas and 60 m (200 ft) in rural areas.

Support:

Examples of approach markings for obstructions in the roadway are shown in Figure 3B-13.

Option:

Where observed speeds exceed posted or statutory speed limits, longer tapers may be used.

Standard:

If traffic is required to pass only to the right of the obstruction, the markings shall consist of a two-direction no-passing zone marking at least twice the length of the diagonal portion as determined by the appropriate taper formula (see Figure 3B-13).

Option:

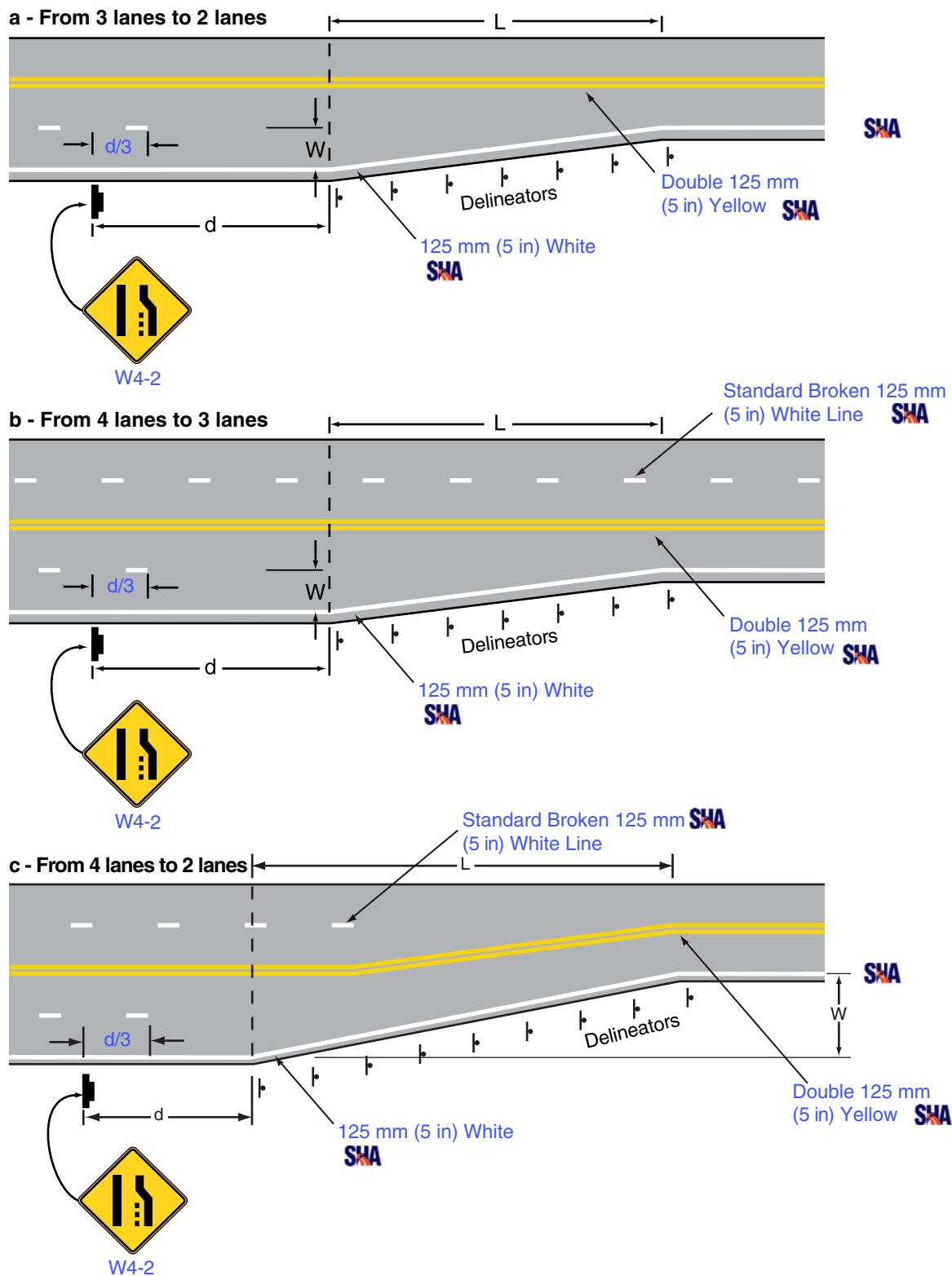
If traffic is required to pass only to the right of the obstruction, yellow diagonal approach markings may be placed in the neutral area between the no-passing zone markings as shown in Figure 3B-13. Other markings, such as yellow delineators, raised pavement markers, and white crosswalk pavement markings, may also be placed in the neutral area.

Standard:

If traffic can pass either to the right or left of the obstruction, the markings shall consist of two channelizing lines diverging from the lane line, one to each side of the obstruction. In advance of the point of divergence, a solid wide white line or solid double normal white line shall be extended in place of the broken lane line for a distance equal to the length of the diverging lines (see Figure 3B-13).

Option:

If traffic can pass either to the right or left of the obstruction, additional white markings may be placed in the neutral area between the channelizing lines as shown in Figure 3B-13.

Figure 3B-12. Examples of Lane Reduction Markings

L = Length in meters (feet)
 S = Posted, 85th-percentile, or statutory speed in km/h (mph)
 W = Offset in meters (feet)
 d = Advance warning distance (see Section 2C.05)
 See Section 3D.04 for delineator spacing.

For speeds 70 km/h (45 mph) or more:
 $L = 0.62 WS$ ($L = WS$)

For speeds less than 70 km/h (45 mph):
 $L = \frac{WS^2}{155}$ ($L = \frac{WS^2}{60}$)

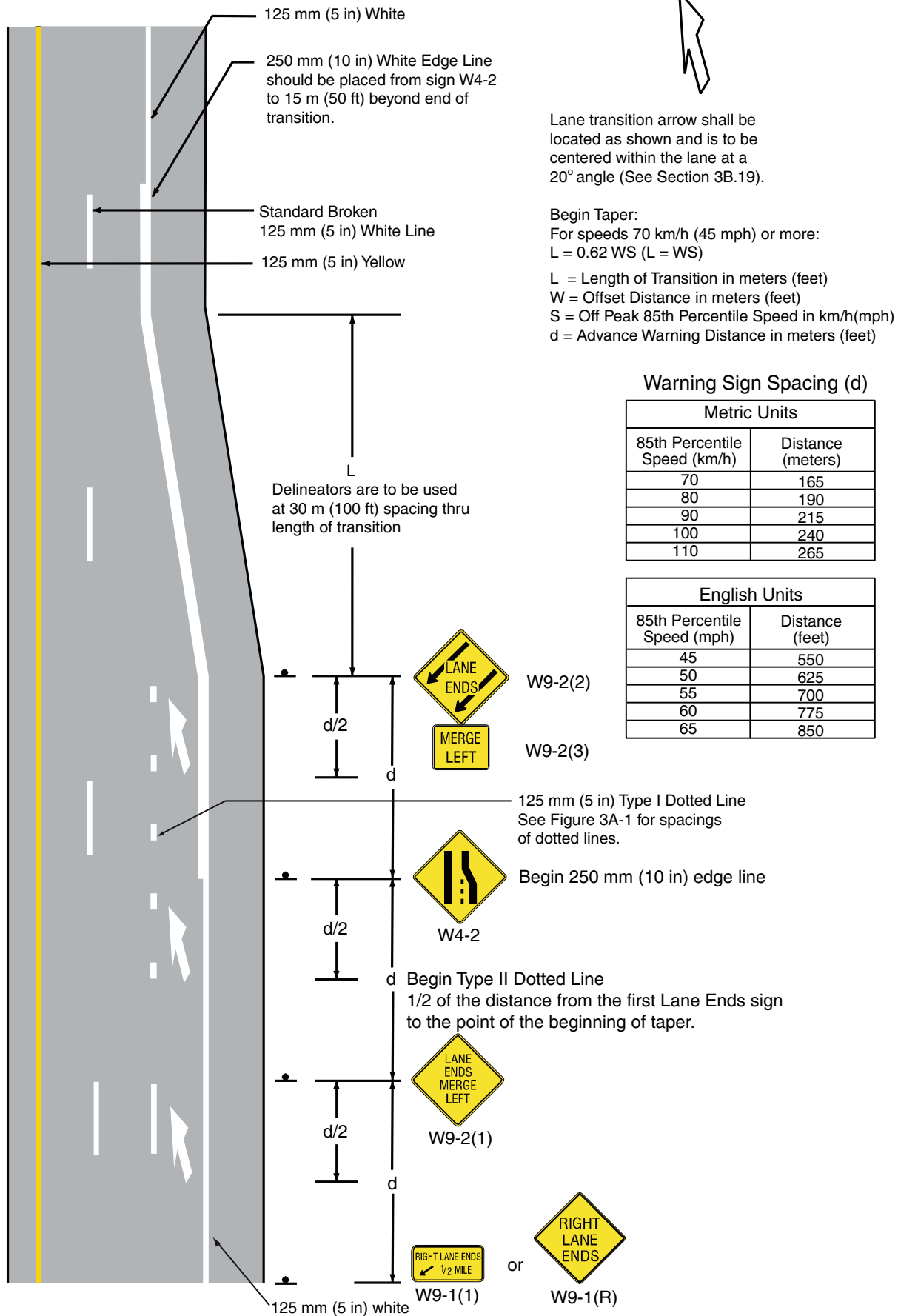
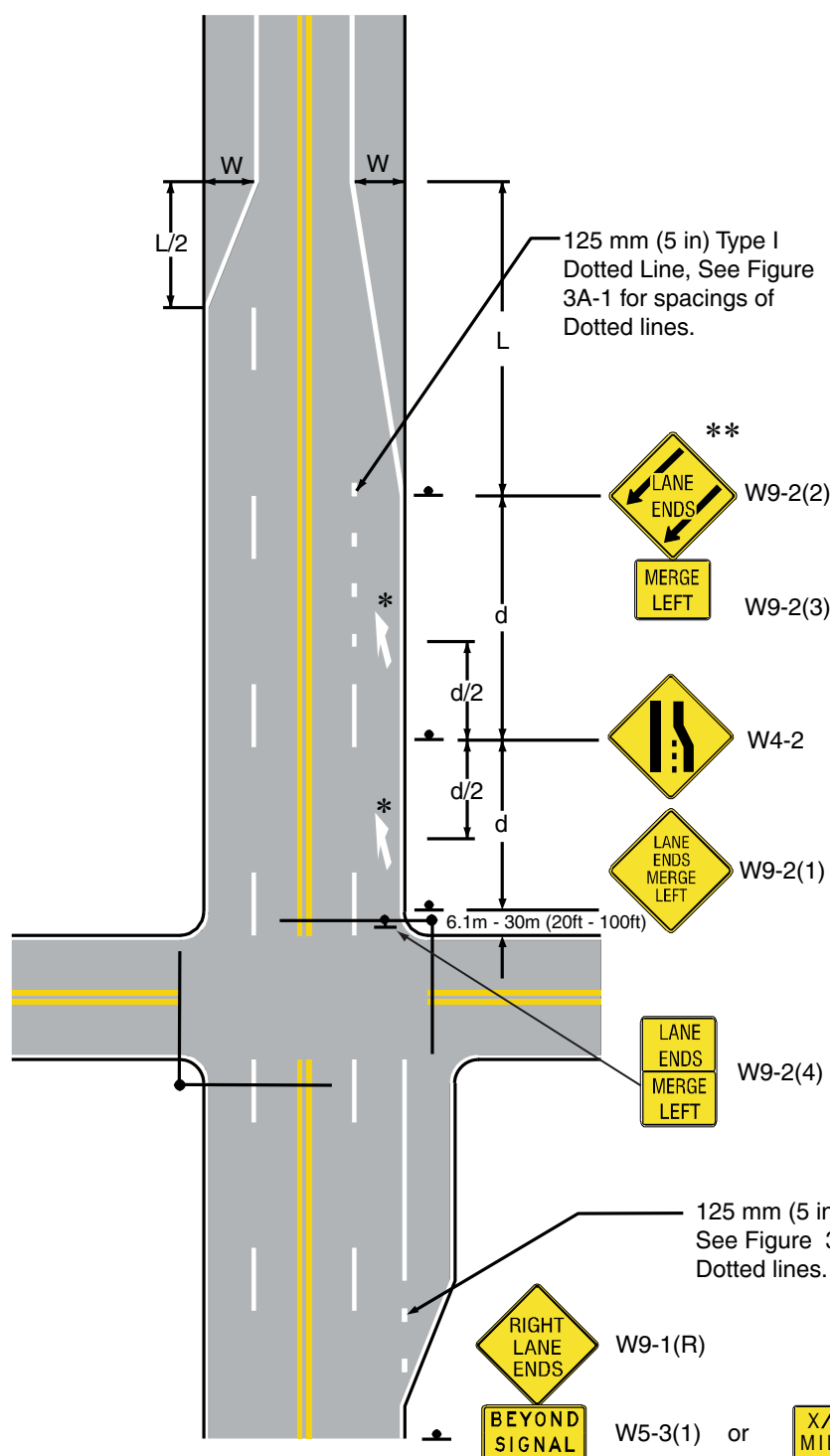
Figure 3B-12a. Examples of Lane Reduction Transition - Expressway  07/09

Figure 3B-12b. Examples of Intermediate Intersection Lane Reduction Marking - Divided and Undivided Roadways

SHA
07/09



Begin Taper:

For speeds 70 km/h (45 mph) or more:

$$L = 0.62 WS \quad (L = WS)$$

For speeds less than 70 km/h (45 mph):

$$L = WS^2 / 155 \quad (L = WS^2 / 60)$$

L = Length of Transition in meters (feet)

W = Offset Distance in meters (feet)

S = Off Peak 85th Percentile Speed in km/h (mph)

d = Advance Warning Distance in meters (feet)

Warning Sign Spacing (d)

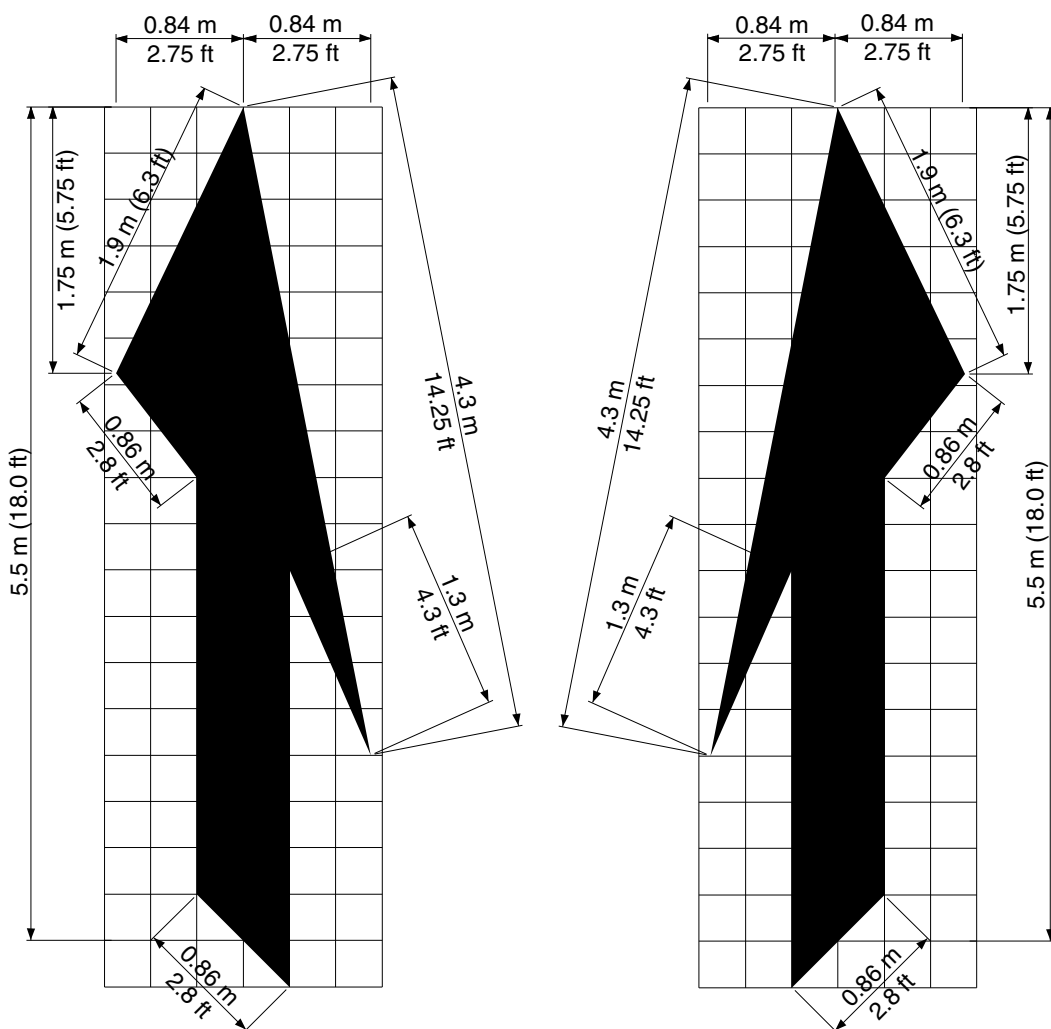
Metric Units	
85th Percentile Speed (km/h)	Distance (meters)
30	70
40	95
50	115
60	140
70	165
80	190
90	215
100	240
110	265

English Units	
85th Percentile Speed (mph)	Distance (feet)
20	175
25	250
30	325
35	400
40	475
45	550
50	625
55	700
60	775
65	850

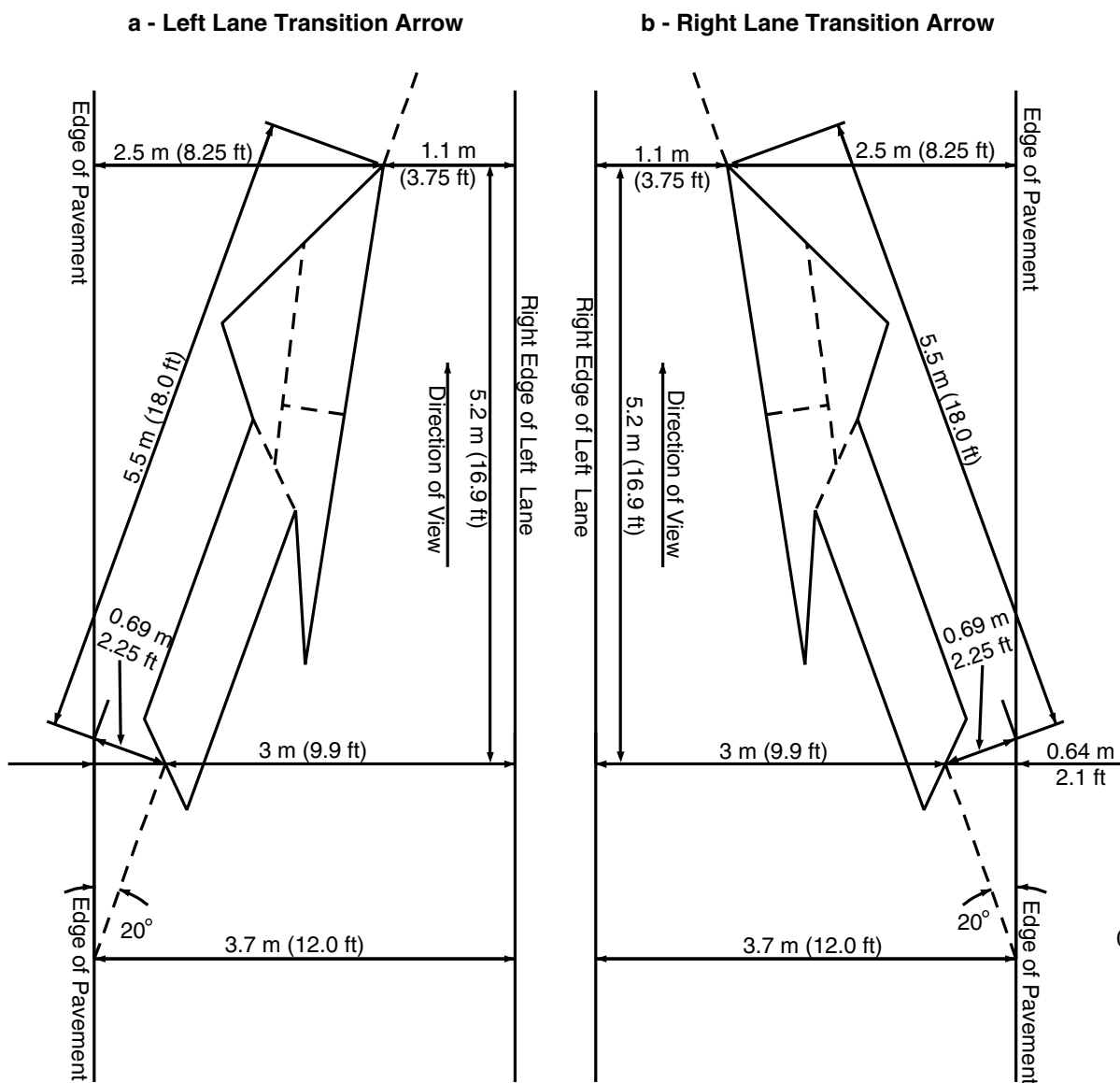
* Lane Transition Arrows are not used if 85th Percentile Speed < 80 km/h (45 mph)

** Lane Ends W9-2(2) signs are not used if 85th Percentile Speed < 80 km/h (45 mph)

The length of the auxiliary lane should be determined by referencing the latest edition of AASHTO's "A Policy on Geometric Design of Highways and Streets".

Figure 3B-12c. Examples of Lane Reduction Transition Arrow Detail**a - Left Lane Transition Arrow****b - Right Lane Transition Arrow**

0.3 m (12 in) Grid
 Area = 3.9 m² (42 ft²)

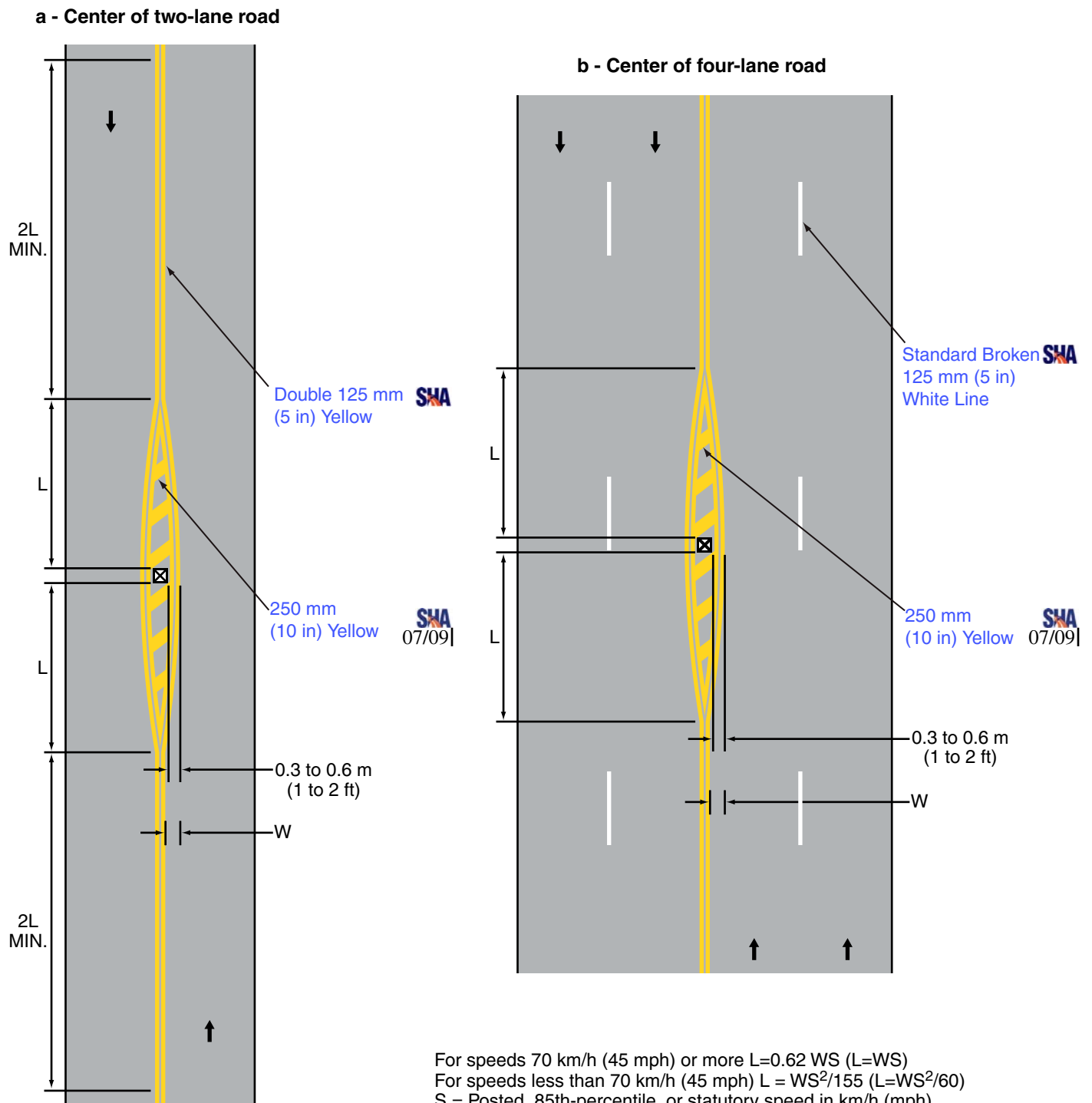
Figure 3B-12d. Examples of Lane Reduction Transition Arrow Placement.

07/09]

NOTE:

Broken lines (---) illustrate the four (4) typical lane transition pavement marking arrow pieces.

Figure 3B-13. Examples of Markings for Obstructions in the Roadway
(Sheet 1 of 2)



Legend

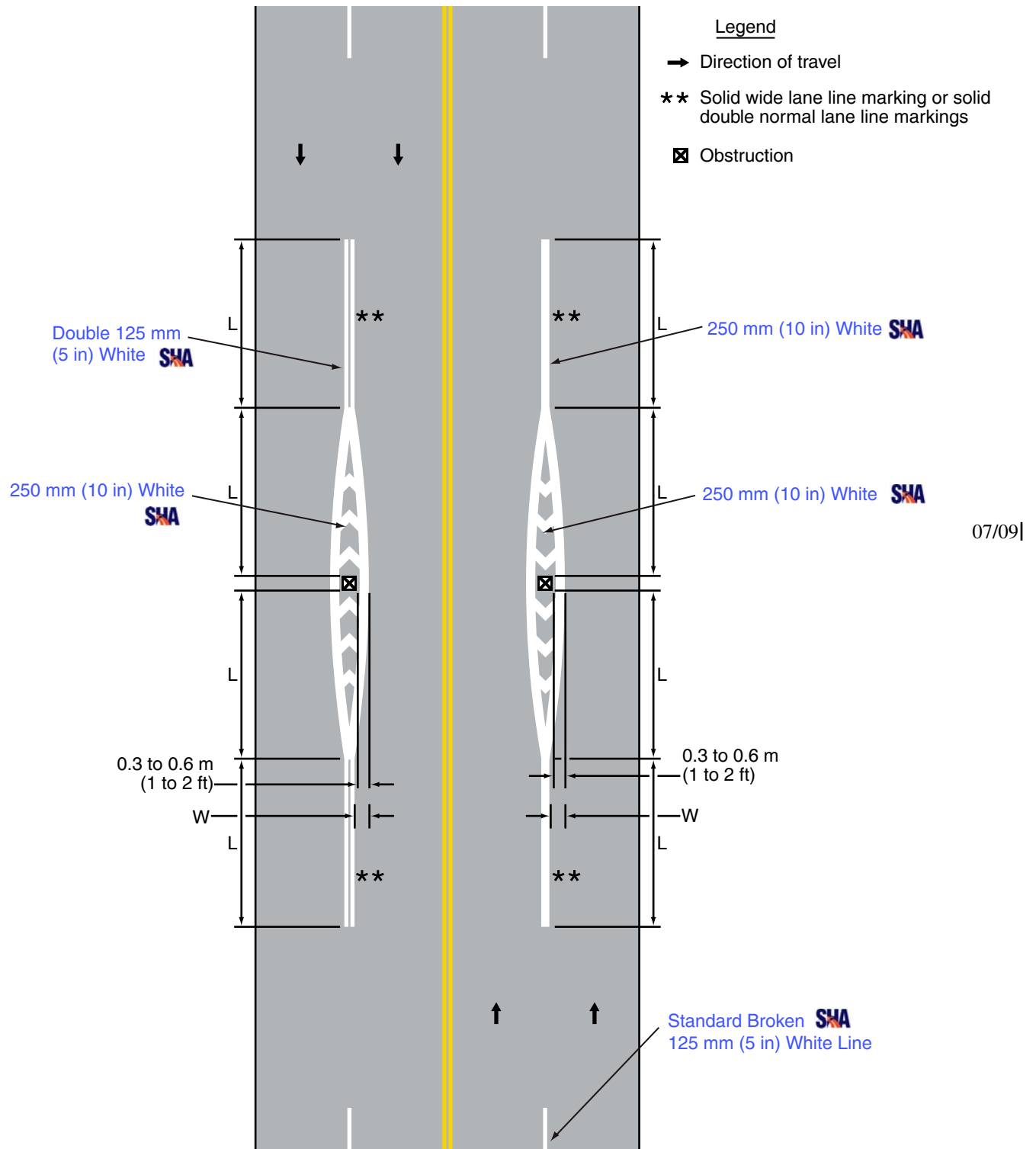
- Direction of travel
- ⊗ Obstruction

Minimum length of : $L = 30$ m (100 ft) in urban areas
 $L = 60$ m (200 ft) in rural areas

Length "L" should be extended as required by sight distance conditions

Figure 3B-13. Examples of Markings for Obstructions in the Roadway
(Sheet 2 of 2)

c - Traffic passing both sides of obstruction



For speeds 70 km/h (45 mph) or more $L=0.62 WS$ ($L=WS$)
 For speeds less than 70 km/h (45 mph) $L=WS^2/155$ ($L=WS^2/60$)
 S = Posted, 85th-percentile, or statutory speed in km/h (mph)
 W = Offset distance in meters (ft)

Minimum length of : L = 30 m (100 ft) in urban areas
L = 60 m (200 ft) in rural areas

Length "L" should be extended as required by sight distance conditions

Section 3B.11 Raised Pavement Markers

Standard:

A raised pavement marker shall be a device with a height of at least 10 mm (0.4 in) mounted on or in a road surface that is intended to be used as a positioning guide or to supplement or substitute for pavement markings or to mark the position of a fire hydrant.

The color of raised pavement markers under both day light and night time conditions shall conform to the color of the marking for which they serve as a positioning guide, or for which they supplement or substitute.

Option:

Blue raised pavement markers may be used to mark the positions of fire hydrants.

Support:

Retroreflective and internally illuminated raised pavement markers are available in monodirectional and bidirectional configurations. The bidirectional marker is capable of displaying the applicable color for each direction of travel.

Guidance:

Nonretroreflective raised pavement markers should not be used alone, without supplemental retroreflective or internally illuminated markers, as a substitute for other types of pavement markings.

Directional configurations should be used to maximize correct information and to minimize confusing information provided to the road user. Directional configurations also should be used to avoid confusion resulting from visibility of markers that do not apply to the road user.

The spacing of raised pavement markers used to supplement or substitute for other types of longitudinal markings should correspond with the pattern of broken lines for which the markers supplement or substitute.

Standard:

The value of N for the spacing of raised pavement markers for a broken or dotted line shall equal the length of one line segment plus one gap. The value of N referenced for solid lines shall equal the N for the broken or dotted lines that might be adjacent to or might extend the solid lines (see Sections 3B.13 and 3B.14).

Support:

Figures 9-20 through 9-22 in the "Traffic Control Devices Handbook" (see Section 1A.11) contain additional information regarding the spacing of raised pavement markers on longitudinal markings.

The "Raised Pavement Marker Guidelines" contains further information regarding the application of RPM's. This guideline can be obtained from the Maryland State Highway Administration's Office of Traffic & Safety, Traffic Development & Support Division (TDSD) at the address shown on Page i.



Section 3B.12 Raised Pavement Markers as Vehicle Positioning Guides with Other Longitudinal Markings

Option:

Raised pavement markers may be used as positioning guides with longitudinal line markings without necessarily conveying information to the road user about passing or lane-use restrictions. In such applications, markers may be positioned between the two lines of a one-way or two-way no-passing zone marking or positioned in line with or immediately adjacent to single solid or broken centerline or lane line markings.

Support:

A typical spacing for such applications is $2N$, where N equals the length of one line segment plus one gap (see Section 3B.11).

Option:

Where it is desired to alert the road user to changes in the travel path, such as on sharp curves or on transitions that reduce the number of lanes or that shift traffic laterally, the spacing may be reduced to N or less.

On freeways and expressways, a spacing of $3N$ may be used for relatively straight and level roadway segments where engineering judgment indicates that such spacing will provide adequate delineation under wet night conditions.

Section 3B.13 Raised Pavement Markers Supplementing Other Markings

Guidance:

The use of raised pavement markers for supplementing longitudinal line markings should conform to the following:

A. Lateral Positioning

1. When supplementing double line markings, pairs of raised pavement markers placed laterally in line with or immediately outside of the two lines should be used.
2. When supplementing wide line markings, pairs of raised pavement markers placed laterally adjacent to each other should be used.

B. Longitudinal Spacing

1. When supplementing solid line markings, raised pavement markers at as spacing no greater than N (see Section 3B.11) should be used, except when supplementing left edge line markings, as spacing of no greater than N/2 should be used. Raised markers should not supplement right edge line markings.
2. When supplementing broken line markings, as spacing no greater than 3N should be used. However, when supplementing broken line markings identifying reversible lanes, as spacing of no greater than N should be used.
3. When supplementing dotted line markings, as spacing appropriate for the application should be used.
4. When supplementing longitudinal line markings through at-grade intersections, one raised pavement marker for each short line segment should be used.
5. When supplementing edge line extensions through freeway interchanges, as spacing of no greater than N should be used.
6. When supplementing wrong-way arrow markings, see Figure 3B-23a for details.

Figures 3B-2a, 3B-3a, Figures 3B-7b, 3B-7c, 3B-7e, 3B-7f, Figures 3B-8, Figures 3B-9, 3B-9b, 3B-9d, and Figure 3B-10, 3B-10b, 3B-10d show the raised pavement markers applications.



Option:

Raised pavement markers also may be used to supplement other markings for channelizing islands or approaches to obstructions.

Section 3B.14 Raised Pavement Markers Substituting for Pavement Markings

Option:

Retroreflective or internally illuminated raised pavement markers, or nonretroreflective raised pavement markers supplemented by retroreflective or internally illuminated markers, may be substituted for markings of other types.

Guidance:

If used, the pattern and color of the raised pavement markers should simulate the pattern and color of the markings for which they substitute.

The normal spacing of raised pavement markers, when substituting for other markings, should be determined in terms of the standard length of the broken line segment.

Option:

The side of a raised pavement marker that is visible to traffic proceeding in the wrong direction may be red.

Standard:

If raised pavement markers are used to substitute for broken line markings, a group of three to five markers equally spaced at a distance no greater than N/8 (see Section 3B.11) shall be used. If N is other than 12 m (40 ft), the markers shall be equally spaced over the line segment length (at 1/2 points for 3 markers, at 1/3 points for 4 markers, and at 1/4 points for 5 markers). At least one retroreflective or internally illuminated marker per group shall be used or a retroreflective or internally illuminated marker shall be installed midway in each gap between successive groups of nonretroreflective markers.

When raised pavement markers substitute for solid lane line markings, the markers shall be equally spaced at no greater than N/4, with retroreflective or internally illuminated units at a spacing no greater than N/2.

Guidance:

Raised pavement markers should not substitute for right edge line markings.

Standard:

When raised pavement markers substitute for dotted lines, they shall be spaced at no greater than N/4, with not less than one raised pavement marker per dotted line. At least one raised marker every N shall be retroreflective or internally illuminated.

Option:

When substituting for wide lines, raised pavement markers may be placed laterally adjacent to each other to simulate the width of the line.

Section 3B.15 Transverse Markings**Standard:**

Transverse markings, which include shoulder markings, word and symbol markings, stop lines, yield lines, crosswalk lines, speed measurement markings, speed hump markings, parking space markings, and others, shall be white unless otherwise specified herein.

Guidance:

Because of the low approach angle at which pavement markings are viewed, transverse lines should be proportioned to provide visibility equal to that of longitudinal lines.

Standard:

Pavement marking letters, numerals, and symbols shall be installed in accordance with the Pavement Markings chapter of the “Standard Highway Signs” book and the “Maryland Supplemental Signs” book (see Section 1A.11).

**Section 3B.16 Stop and Yield Lines****Standard:**

If used, stop lines shall consist of solid white lines extending across approach lanes to indicate the point at which the stop is intended or required to be made.

If used, yield lines (see Figure 3B-14) shall consist of a row of solid white isosceles triangles pointing toward approaching vehicles extending across approach lanes to indicate the point at which the yield is intended or required to be made.

Guidance:

Stop lines should be 300 to 600 mm (12 to 24 in) wide.

On State owned and operated roadways, stop lines should be 400 mm or 600 mm (16 in or 24 in).



Stop lines should be used to indicate the point behind which vehicles are required to stop, in compliance with a STOP (R1-1) sign, traffic control signal, or some other traffic control device, except YIELD signs.

The individual triangles comprising the yield line should have a base of 300 mm to 600 mm (12 in or 24 in) wide and a height equal to 1.5 times the base. The space between the triangles should be 75 to 300 mm (3 to 2 in).



When used, Stop lines should be placed parallel to the intersecting roadway if there are no crosswalk lines. If there are crosswalk lines, the Stop line should be parallel to the crosswalk. See Figure 3B-16.

**Option:**

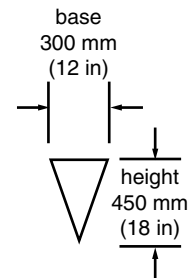
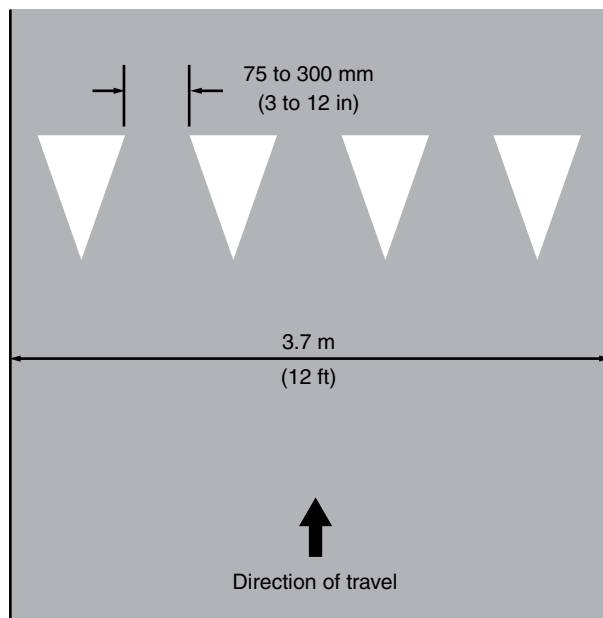
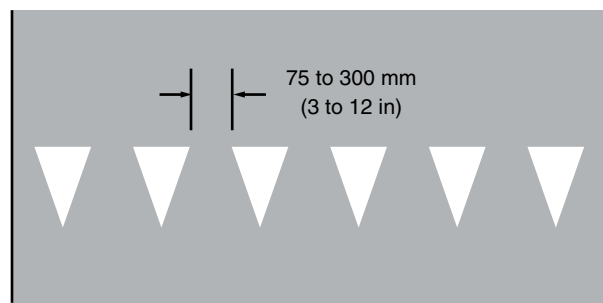
Yield lines may be used to indicate the point behind which vehicles are required to yield in compliance with a YIELD (R1-2) sign.

Guidance:

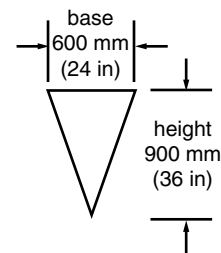
If used, stop and yield lines should be placed a minimum of 1.2 m (4 ft) in advance of the nearest crosswalk line at controlled intersections, except for yield lines at roundabout intersections as provided for in Section 3B.24 and at midblock crosswalks. In the absence of a marked crosswalk, the stop line or yield line should be placed at the desired stopping or yielding point, but should be placed no more than 9 m (30 ft) nor less than 1.2 m (4 ft) from the nearest edge of the intersecting traveled way. Stop lines should be placed to allow sufficient sight distance to all other approaches to an intersection.

When necessary to add emphasis to a YIELD sign, or to mark the location where a stop might be made in compliance with a motorist's responsibility at a YIELD sign, a Yield line should be used (Figure 3B-16a). The yield line should be used at the approach to the second roadway of a divided highway or entrance to a roundabout, whether the approach is marked with a YIELD sign, or not controlled by either a STOP sign or a YIELD sign (Figure 3B-16b).



Figure 3B-14. Examples of Yield Line Layouts

(a) Minimum Dimensions
- For 85th-percentile Speed
less than 65 km/h (40 mph)



(b) Maximum Dimensions
- For 85th-percentile Speed
65 km/h (40 mph) or more

Notes:

Triangle height is equal to 1.5 times the base dimension.

Yield lines may be smaller than suggested when installed on much narrower, slow-speed facilities such as shared-use paths.

Stop lines at midblock signalized locations should be placed at least 12 m (40 ft) in advance of the nearest signal indication (see Section 4D.15).

Edge line extension pavement markings should be installed at ramps where merge area are not provided (see [Figure 3B-16c](#)). 

Support:

Drivers who yield too close to crosswalks on multi-lane approaches place pedestrians at risk by blocking other drivers' views of pedestrians.

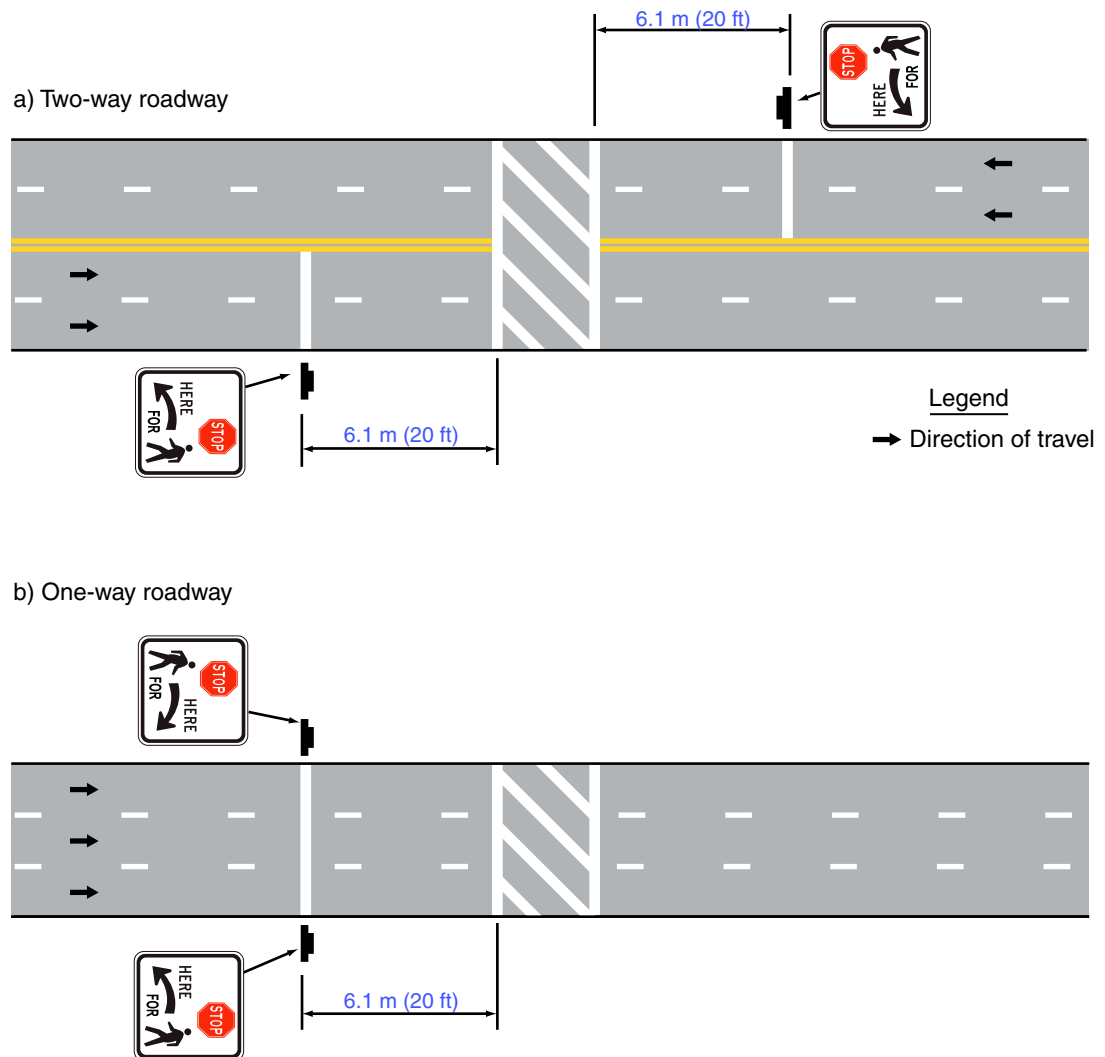
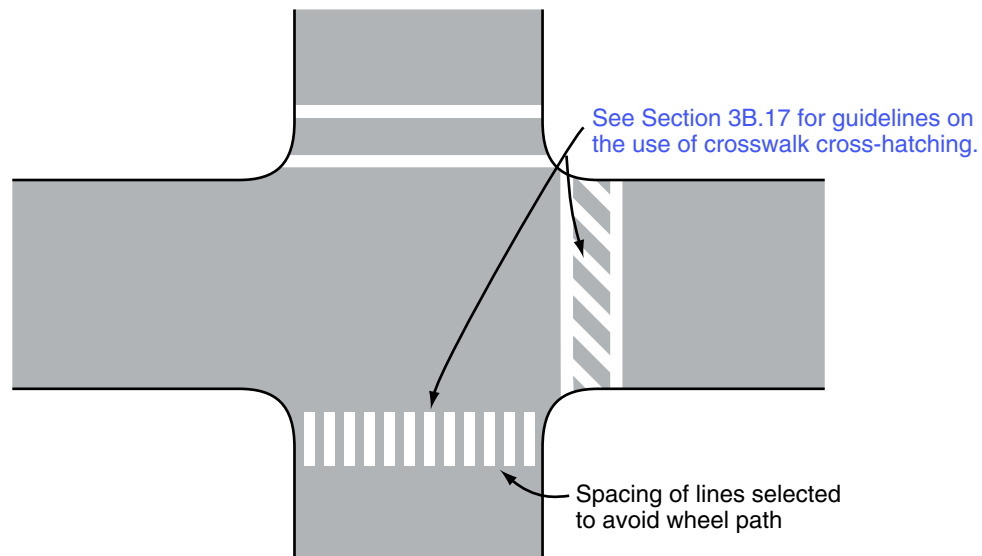
Figure 3B-15. Examples of Stop Lines at Unsignalized Midblock Crosswalks 

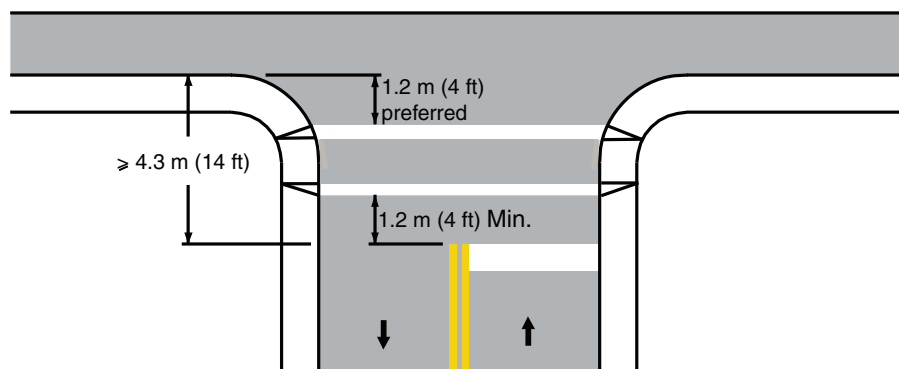
Figure 3B-16. Examples of Crosswalk Markings and Stop Lines
(Sheet 1 of 2)



a - Crosswalk Markings



b - Stop Line Parallel to Side Street Crosswalk



Width of Stop Line:

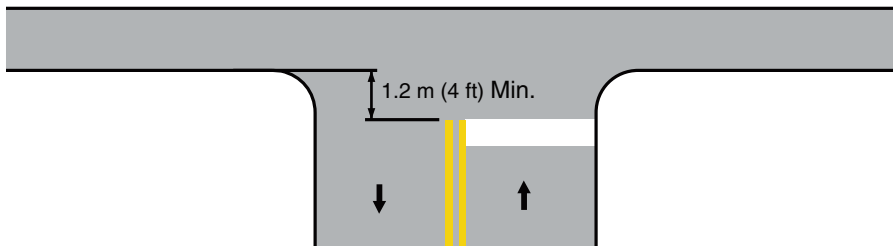
- 400 mm (16 in), for side street speed limit 55 km/h (35 mph) and below.
- 600 mm (24 in), for side street speed limit above 55 km/h (35 mph).

Figure 3B-16. Examples of Crosswalk Markings and Stop Lines
(Sheet 2 of 2)



Legend
→ Direction of travel

c - Stop Line Parallel to Intersecting Roadway



Width of Stop Line:

- 400 mm (16 in), for side street speed limit 55 km/h (35 mph) and below.
- 600 mm (24 in), for side street speed limit above 55 km/h (35 mph).

d - Skewed Intersection

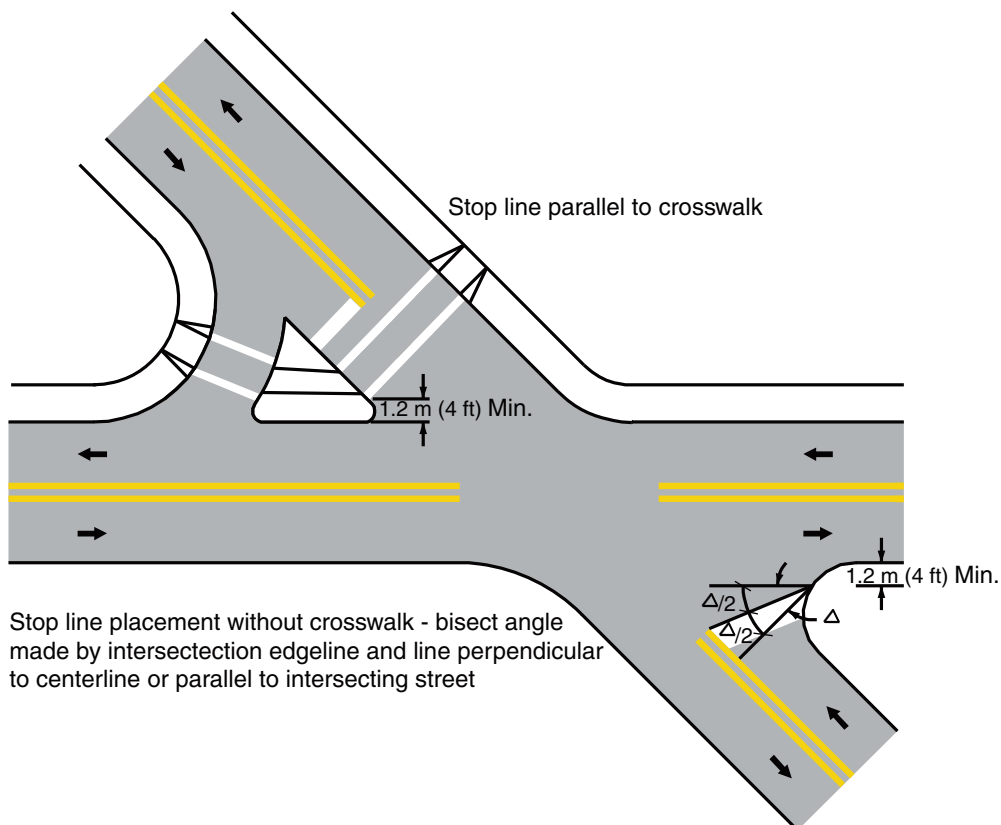
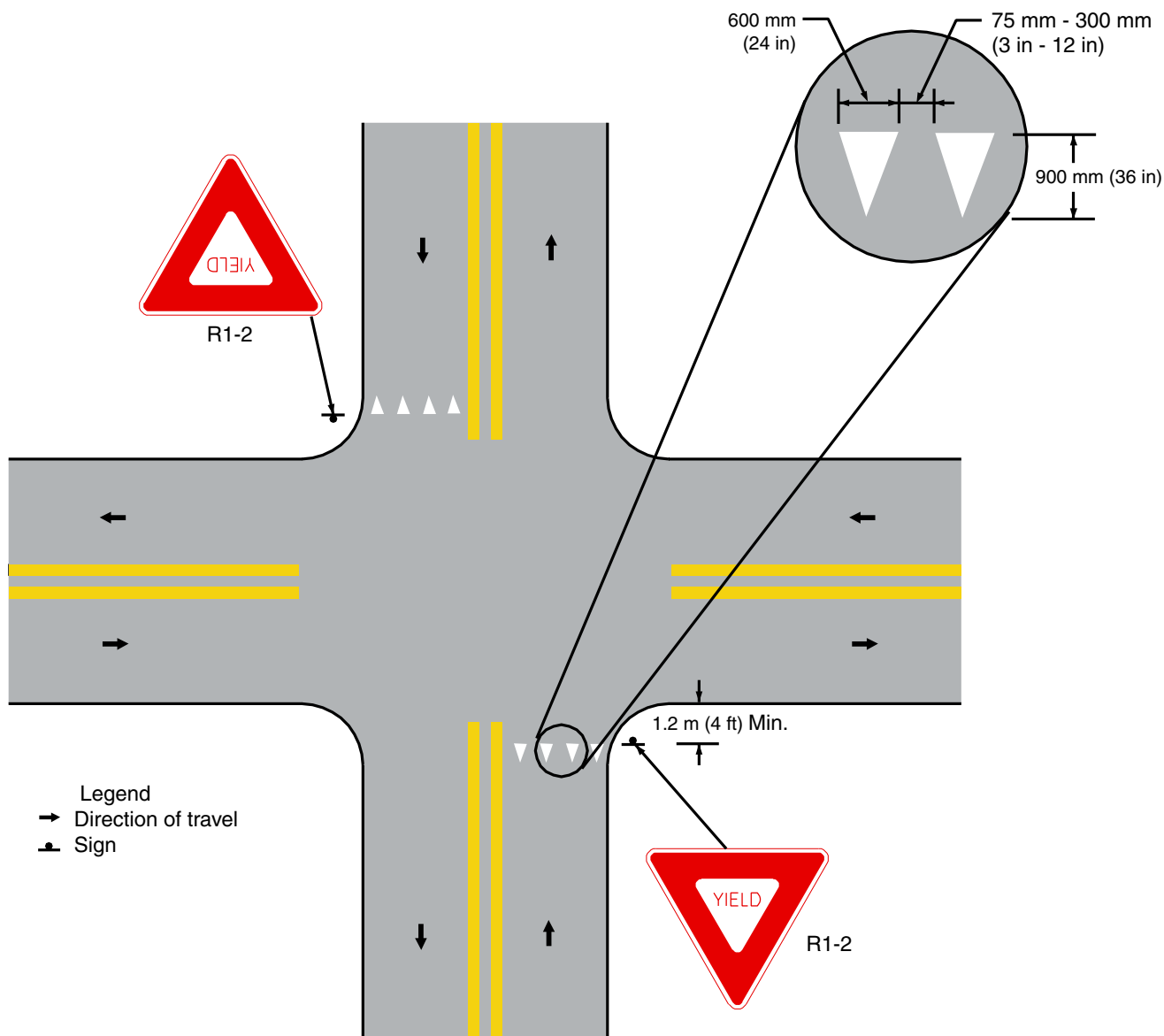


Figure 3B-16a. Examples of Yield or Reference Line as Extension of Edge Line at YIELD Sign Approach to Intersection.

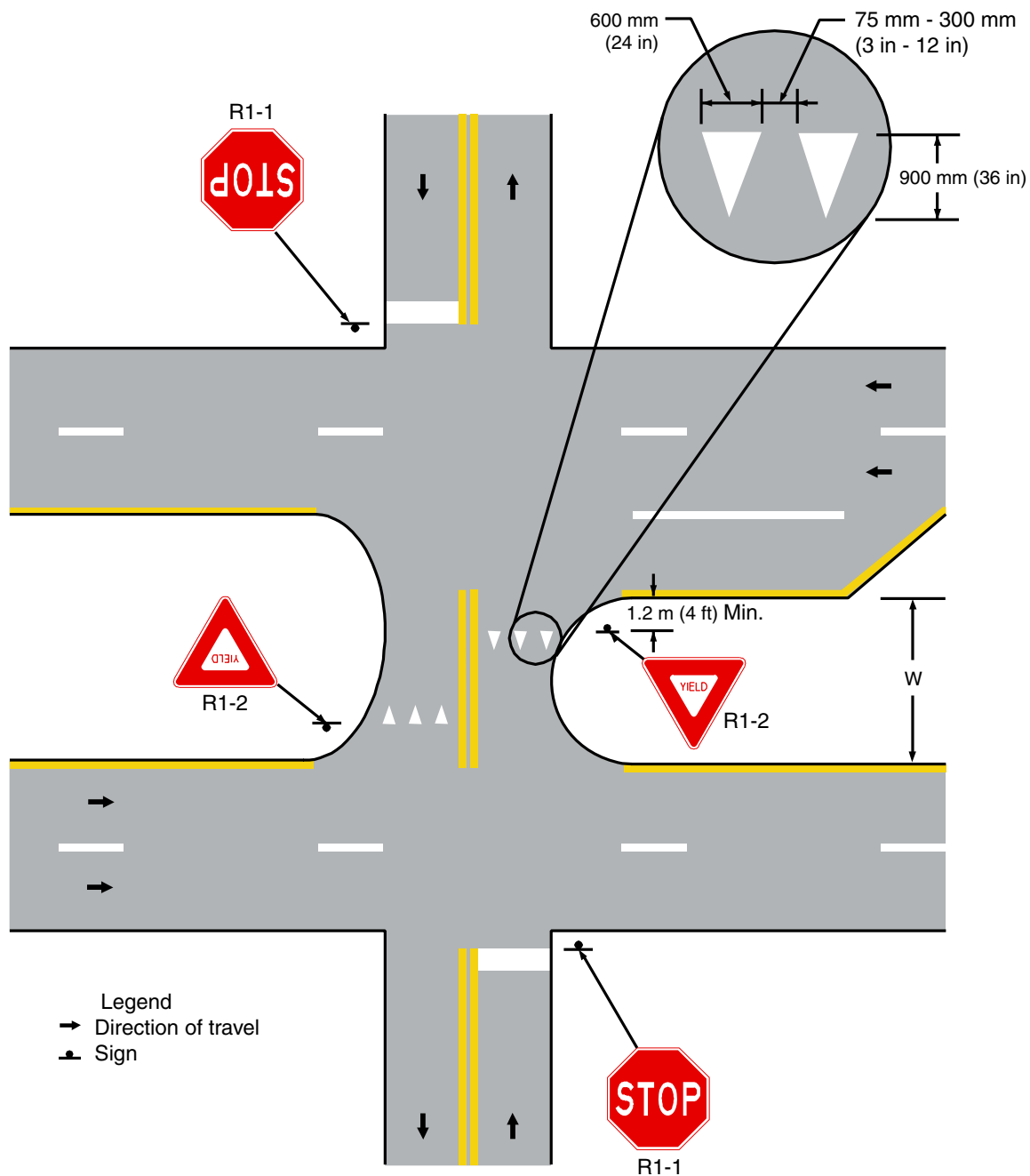


Notes:

Triangle Length and Base Dimension

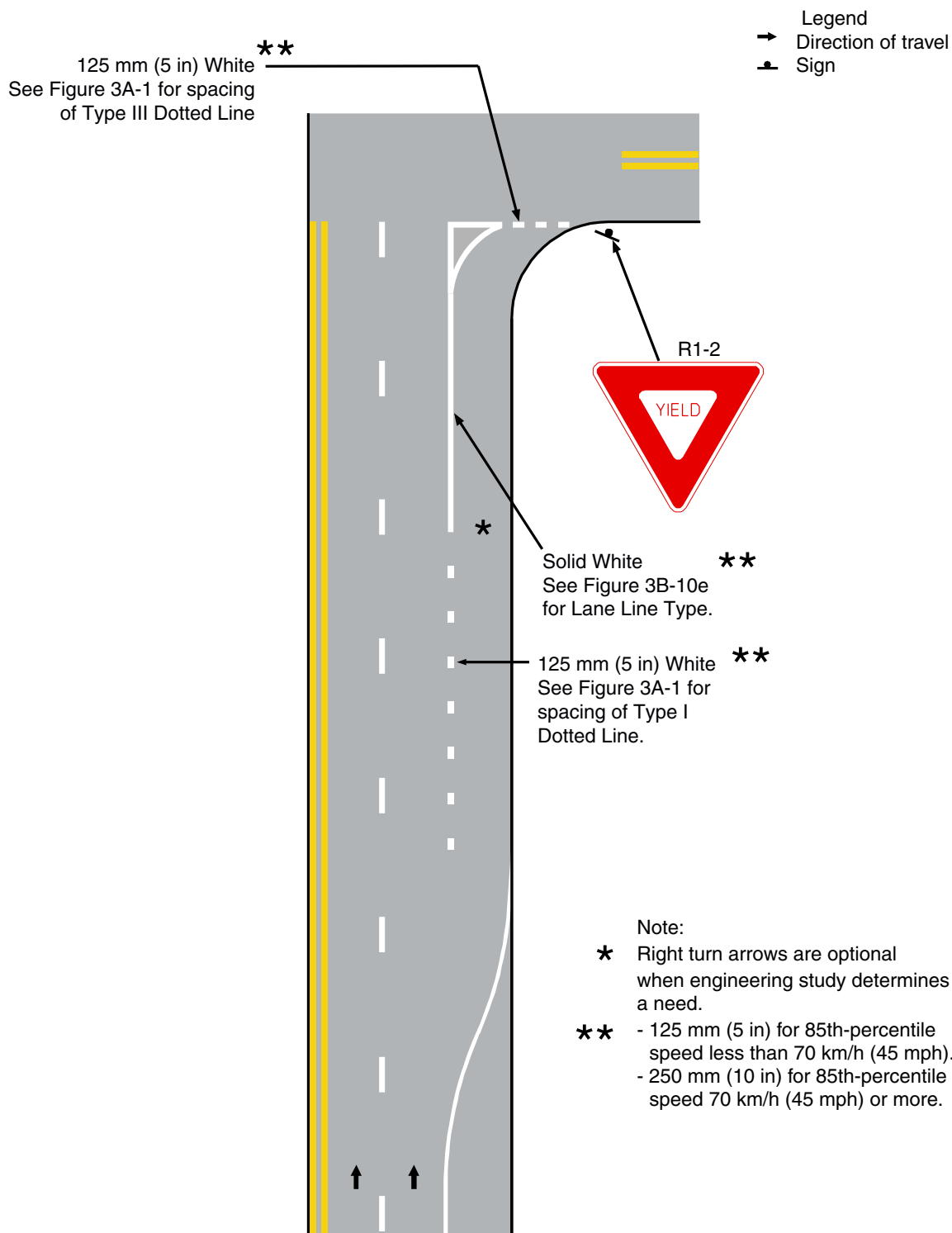
- 450 mm / 300 mm (18 in / 12 in), for side street speed limit 65 km/h (40 mph) and below.
- 900 mm / 600 mm (36 in / 24 in), for side street speed limit above 65 km/h (40 mph).

Figure 3B-16b. Examples of YIELD Sign at Second Roadway of Divided Highway Yield Lines



Notes:

1. The Yield sign placement and location is based on:
 - Width of median opening, $W \geq 15$ m (50 ft)
 - Turning radius
 - Storage length in median opening
2. Triangle Length and Base Dimension:
 - 450 mm / 300 mm (18 in / 12 in), for side street speed limit 65 km/h (40 mph) and below.
 - 900 mm / 600 mm (36 in / 24 in), for side street speed limit above 65 km/h (40 mph).
3. Double Yellow Pavement Markings should be placed in the median if $W \geq 15$ m (50 ft).

Figure 3B-16c. Examples of Edge Line Extension at Ramp without Merge Area

Section 3B.17 Crosswalk Markings

Support:

Crosswalk markings provide guidance for pedestrians who are crossing roadways by defining and delineating paths on approaches to and within signalized intersections, and on approaches to other intersections where traffic stops.

Crosswalk markings also serve to alert road users of a pedestrian crossing point across roadways not controlled by highway traffic signals or STOP signs.

At nonintersection locations, crosswalk markings legally establish the crosswalk.

Standard:

When crosswalk lines are used, they shall consist of solid white lines that mark the crosswalk. They shall be not less than 150 mm (6 in) nor greater than 600 mm (24 in) in width.

On State owned, operated, and maintained roadways, crosswalk lines shall be 300 mm (12 in) wide. Across roadways at non-intersection locations, locations that are unexpected, locations within school zones and across ramps, the space between the crosswalk lines shall be hatched with diagonal white lines that are 300 mm (12 in) wide.

SHA

Guidance:

If transverse lines are used to mark a crosswalk, the gap between the lines should not be less than 1.8 m (6 ft).

Crosswalk lines, if used on both sides of the crosswalk, should extend across the full width of pavement or to the edge of the intersecting crosswalk to discourage diagonal walking between crosswalks (see Figures 3B-15 and 3B-16).

Crosswalks should be marked at all intersections where there is a substantial conflict between vehicular and pedestrian movements.

Marked crosswalks also should be provided at other appropriate points of pedestrian concentration, such as at loading islands, midblock pedestrian crossings, or where pedestrians could not otherwise recognize the proper place to cross.

Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at locations away from highway traffic signals or STOP signs.

Because nonintersection pedestrian crossings are generally unexpected by the road user, warning signs (see Section 2C.41) should be installed and adequate visibility should be provided by parking prohibitions.

Support:

Section 3B.16 contains information regarding placement of stop line markings near crosswalk markings.

Option:

For added visibility, the area of the crosswalk may be marked with white diagonal lines at a 45-degree angle to the line of the crosswalk or with white longitudinal lines parallel to traffic flow as shown in Figure 3B-16 and Figure 3B-17.

When diagonal or longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be omitted. This type of marking may be used at locations where substantial numbers of pedestrians cross without any other traffic control device, at locations where physical conditions are such that added visibility of the crosswalk is desired, or at places where a pedestrian crosswalk might not be expected.

Guidance:

If used, the diagonal or longitudinal lines should be 300 mm (12 in) wide and spaced 600 mm (24 in) apart. The marking design should avoid the wheel paths, and the spacing should not exceed 2.5 times the line width.

SHA

Standard:

SHA

Crosswalks shall be marked at the following locations:

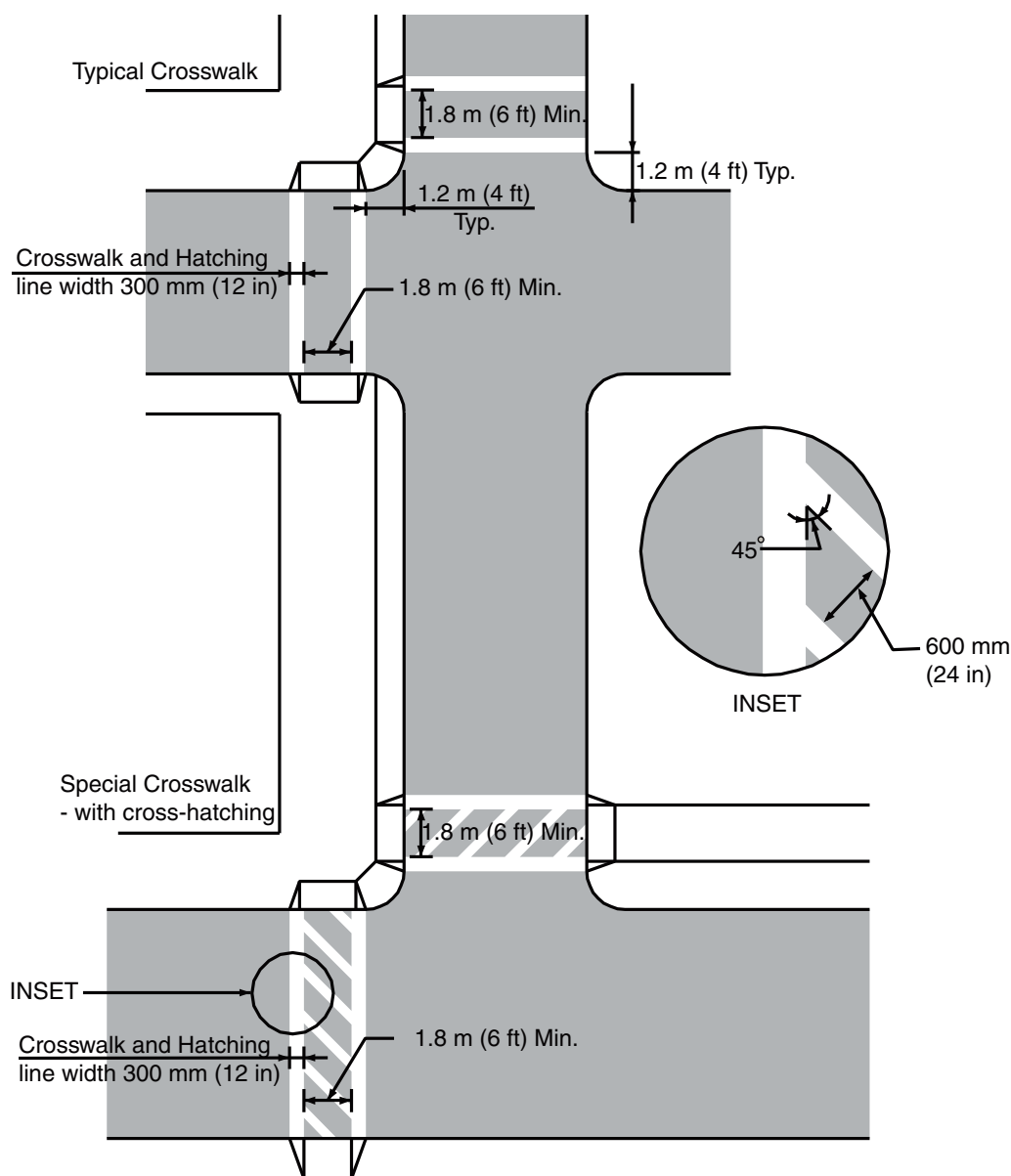
- 1. all school crossings;**
- 2. all recreational pedestrian (hiker) and/or bike crossings;**
- 3. all locations having pedestrian crossing warning signs;**
- 4. all pedestrian crossings having pedestrian signal indications;**
- 5. all mid-block/non-intersection locations;**
- 6. any point where pedestrians crossing would be unexpected.**

Figure 3B-17. Example of Crosswalk Markings for Exclusive Pedestrian Phase That Permits Diagonal Crossing

Not used in Maryland.

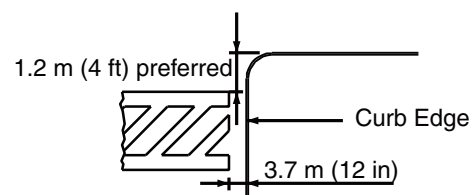


Figure 3B-17a. Examples of Crosswalk and Crosswalk Lines



A crosswalk placed at an intersection is preferred to be placed no closer than 1.2 m (4 ft) from the nearest edge of the intersecting roadway.

Across roadways at non-intersection locations, locations that are unexpected, locations within school zones, and across ramps, crosswalk lines shall be 300 mm (12 in) wide. The space between the crosswalk lines shall be hatched with diagonal white lines that are 300 mm (12 in) wide.



When using lane tape material, allow for gutter drainage by starting material 300 mm (12 in) from the curb edge.

Guidance:

Crosswalks should be marked at the following locations:

1. at points toward which pedestrians are directed to cross through special signing, public information and education campaigns, etc.
2. near major generators of pedestrian activity such as, transit facilities, office parks, stadiums, shopping centers, etc.

3. at intersections having special pedestrian refuge islands/medians.

4. across ramps and right turn slots.

Crosswalks should not be marked where there are no supportable/documented reasons to do so, such as:

1. marked crosswalks have not been shown to provide improved safety over unmarked crosswalks.
2. marked crosswalks may provide a false sense of security for pedestrians who may use less care at crosswalks that are marked.

Section 3B.18 Parking Space Markings**Support:**

Marking of parking space boundaries encourages more orderly and efficient use of parking spaces where parking turnover is substantial. Parking space markings tend to prevent encroachment into fire hydrant zones, bus stops, loading zones, approaches to intersections, curb ramps, and clearance spaces for islands and other zones where parking is restricted. Examples of parking space markings are shown in Figure 3B-18.

Standard:

Parking space markings shall be white.

Option:

Blue lines may supplement white parking space markings of each parking space designated for use only by persons with disabilities.

Support:

Additional parking space markings for the purpose of designating spaces for use only by persons with disabilities are discussed in Section 3B.19 and illustrated in Figure 3B-19.

The accessible design shall follow the Americans with Disabilities Act Standard. More relevant Accessible Parking information is also illustrated in Maryland Vehicle Law from Section 21-1003 to Section 21-1007. For further reference, contact SHA's Office of Traffic and Safety, Traffic Development and Support Division at the address shown on Page i.

**Section 3B.19 Pavement Word and Symbol Markings****Support:**

Word and symbol markings on the pavement are used for the purpose of guiding, warning, or regulating traffic. Symbol messages are preferable to word messages. Examples of standard word and arrow pavement markings are shown in Figures 3B-20 and 3B-21.

Standard:

Word and symbol markings shall be white, except as otherwise noted in this Section.

Guidance:

Letters and numerals should be 1.8 m (6 ft) or more in height.

Word and symbol markings should not exceed three lines of information.

If a pavement marking word message consists of more than one line of information, it should read in the direction of travel. The first word of the message should be nearest to the road user.

Except for the two opposing arrows of a two-way left-turn lane marking (see Figure 3B-7), the longitudinal space between word or symbol message markings, including arrow markings, should be at least four times the height of the characters for low-speed roads, but not more than ten times the height of the characters under any conditions.

The number of different word and symbol markings used should be minimized to provide effective guidance and avoid misunderstanding.

Except as noted in the Option, pavement word and symbol markings should be no more than one lane in width.

Option:

The SCHOOL word marking may extend to the width of two approach lanes (see Section 7C.06).

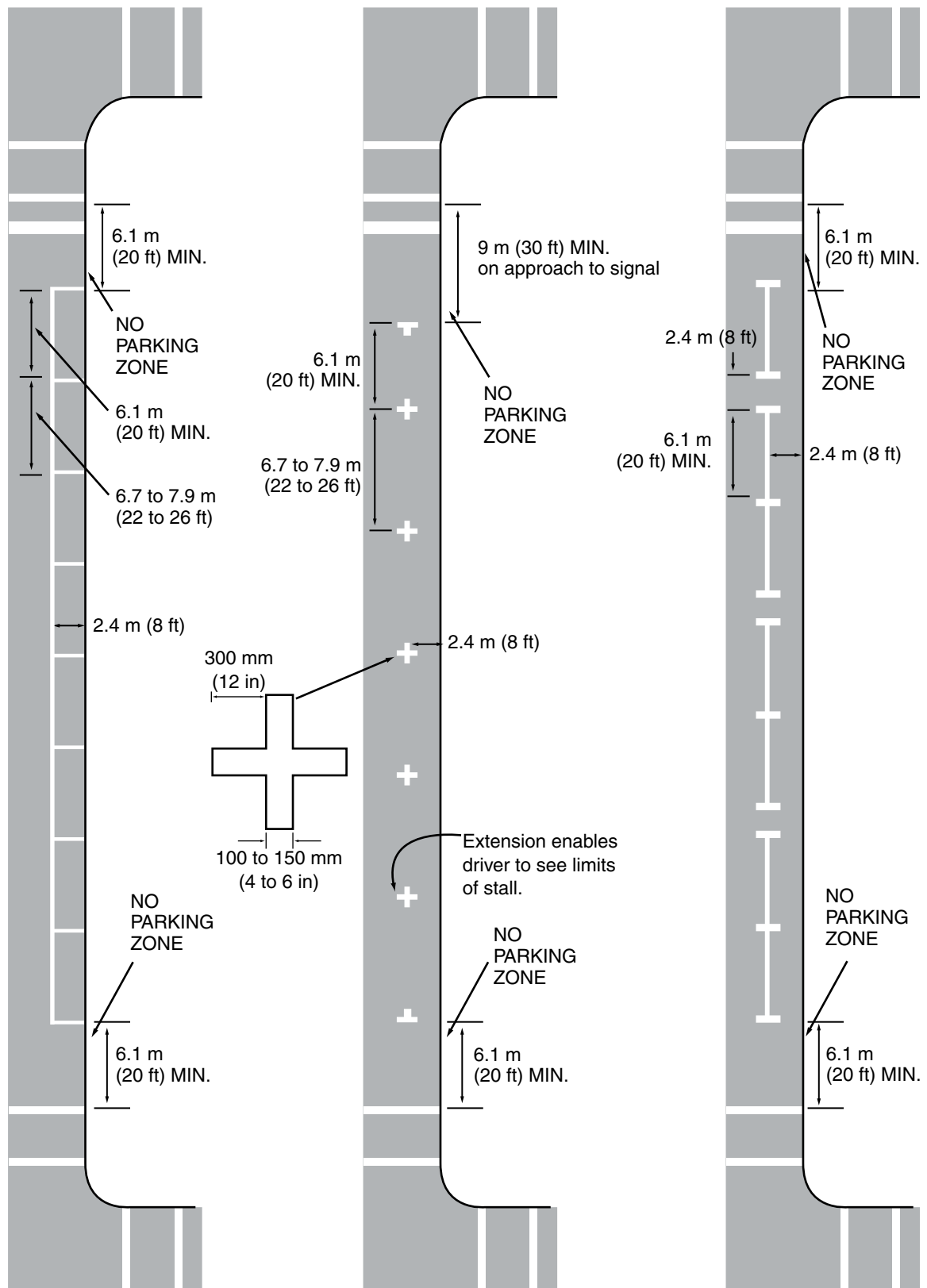
Figure 3B-18. Examples of Parking Space Markings

Figure 3B-19. International Symbol of Accessibility Parking Space Marking with Blue Background and White Border Options

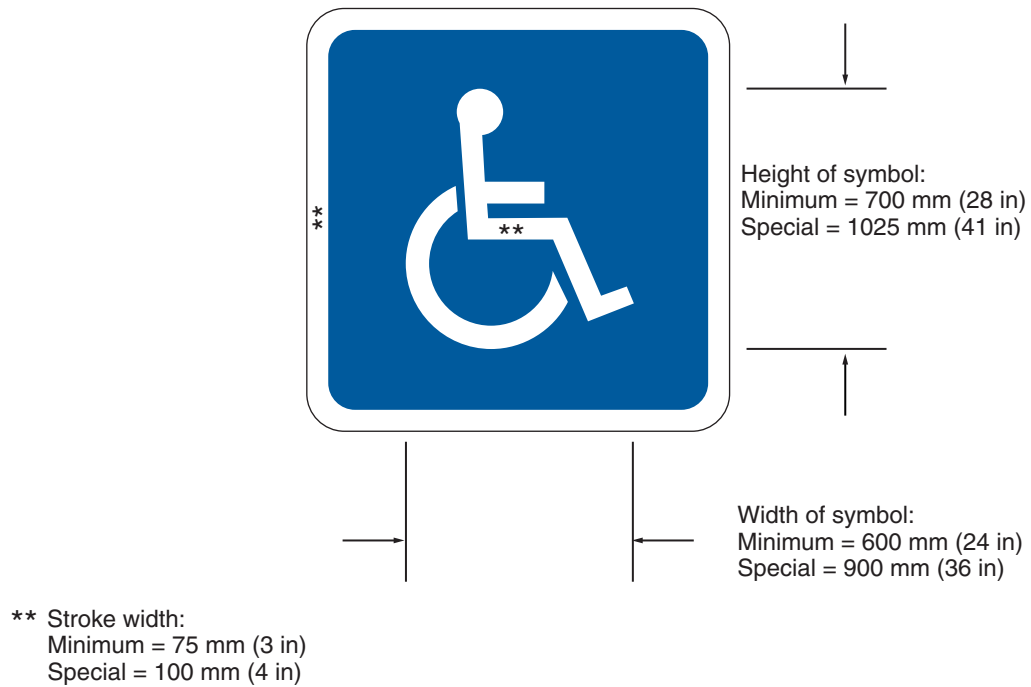
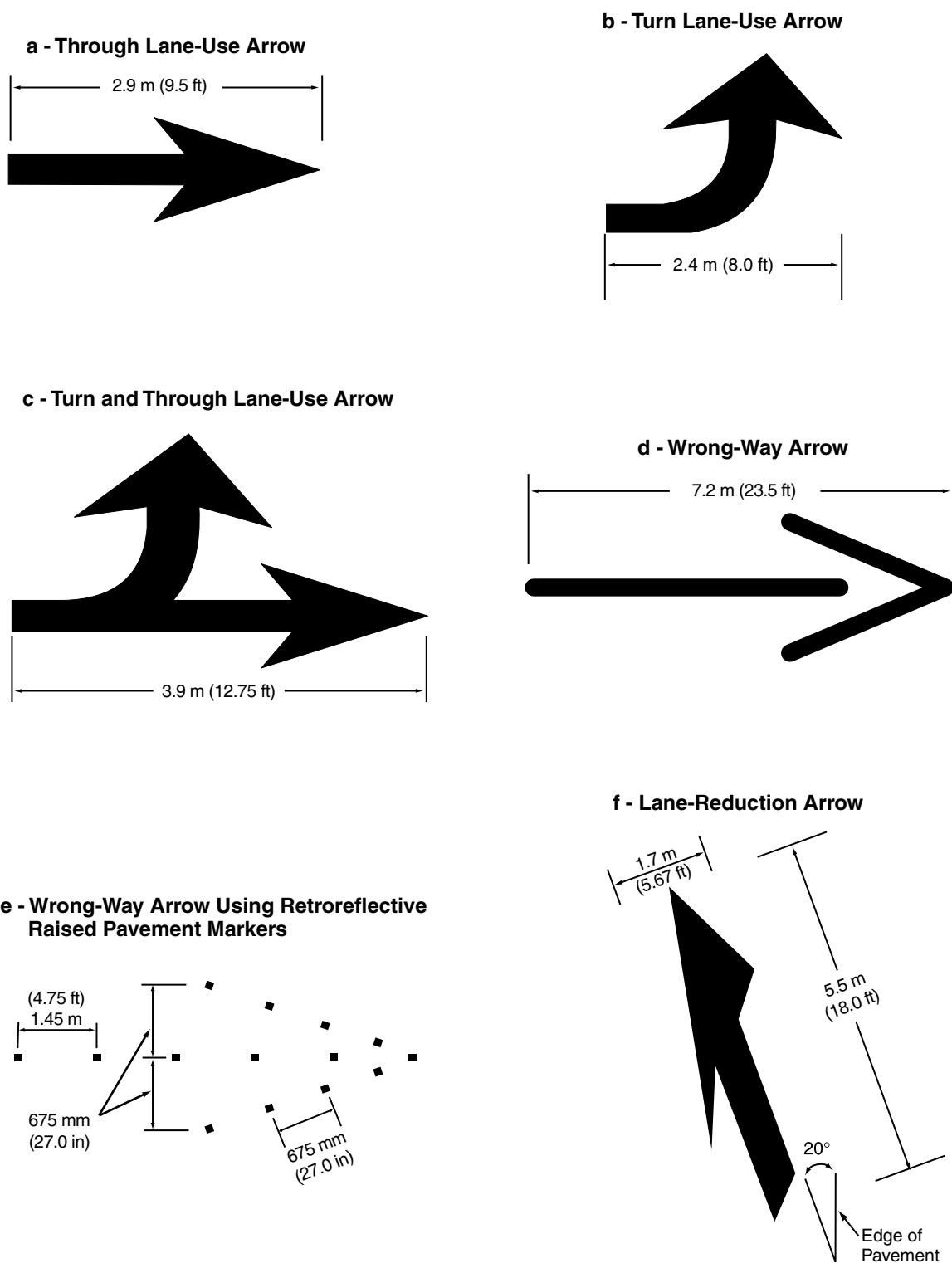


Figure 3B-20. Example of Elongated Letters for Word Pavement Markings



Figure 3B-21. Examples of Standard Arrows for Pavement Markings

Typical sizes for normal installation; sizes may be reduced approximately one-third for low-speed urban conditions; larger sizes may be needed for freeways, above average speeds, and other critical locations. A narrow elongated arrow design is optional. For proper proportion, see the Pavement Markings chapter of the "Standard Highway Signs" book (see Section 1A.11).

Guidance:

When the SCHOOL word marking is extended to the width of two approach lanes, the characters should be 3 m (10 ft) or more in height (see Section 7C.06).

Pavement word and symbol markings should be proportionally scaled to fit within the width of the facility upon which they are applied.

Option:

On narrow, low-speed shared-use paths, the pavement words and symbols may be smaller than suggested, but to the relative scale.

The International Symbol of Accessibility parking space markings may be placed in each parking space designated for use by persons with disabilities. A blue background with white border may supplement the wheelchair symbol as shown in Figure 3B-19.

Standard:

When a lane terminates and a mandatory turn is necessary (lane drop), Turn Lane-Use Arrows and "ONLY" word markings shall be used on non-freeways and shall be accompanied by standard signs (See Figure 3B-21a).

SHA

Lane use, lane reduction, and wrong-way arrow markings shall be designed as shown in Figure 3B-21.

Guidance:

Where through lanes become mandatory turn lanes, signs or markings should be repeated as necessary to prevent entrapment and to help the road user select the appropriate lane in advance of reaching a queue of waiting vehicles.

Option:

Lane-use arrow markings (see Figure 3B-21) may be used to convey either guidance or mandatory messages.

The ONLY word marking (see Figure 3B-20) may be used to supplement lane-use arrow markings (see Figure 3B-22).

In situations where a lane reduction transition occurs, the lane reduction arrow markings shown in Figure 3B-21 may be used.

Standard:**SHA**

The minimum marking configuration for lane drops shall be arrow-ONLY-arrow with an equal distance of 12.5 m to 27.5 m (40 ft to 90 ft) between each segment; i.e., from the center of the word ONLY to the center of each arrow (See the illustrations in Figures 3B-21a, and 3B-21b). The last arrow nearest the intersection shall be approximately 15 m (50 ft) from the intersection, which places the first arrow 40 m to 70 m (130 ft to 230 ft) from the intersection.

Usually the minimum marking is not sufficient to allow motorist in a lane drop to select the appropriate approach lane. Approach speeds (prevailing, not posted speed) are a critical factor.

At signalized intersections the length of the queued vehicles is another critical factor. Whichever factor calls for the longest set of markings shall apply.

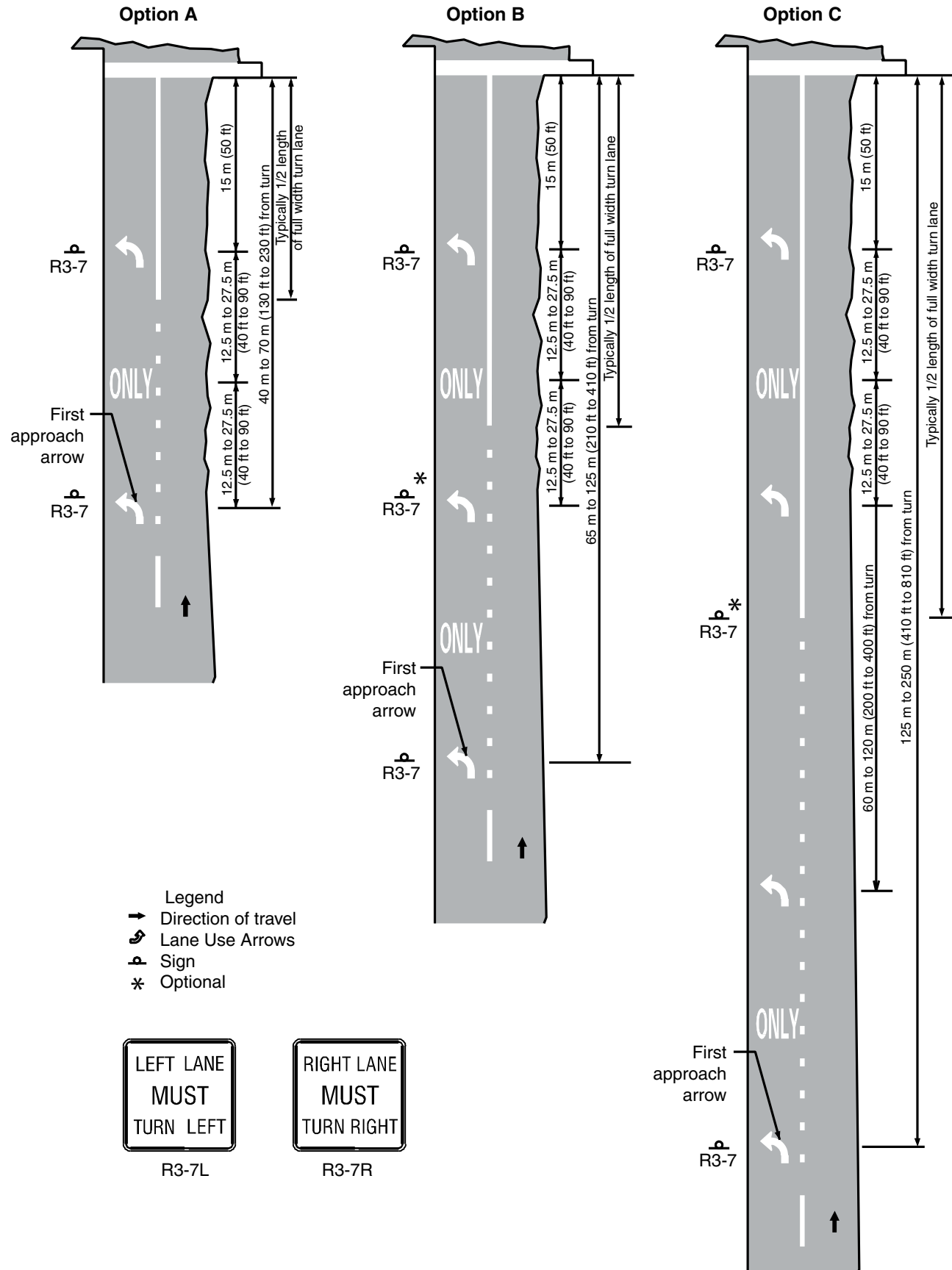
When it is appropriate to place the first arrow 65 m to 125 m (210 ft to 410 ft) from the intersection, an arrow-ONLY-arrow-ONLY-arrow configuration shall be used, again with an equal distance of 12.5 m to 27.5 m (40 ft to 90 ft) for each segment, and with the arrow nearest the intersection approximately 15 m (50 ft) from the intersection.

When a still greater distance is desirable between the first arrow and the intersection, an arrow-ONLY-arrow shall be placed nearest the intersection, as with the minimum marking described above. There shall be an equal distance of 12.5 m to 27.5 m (40 ft to 90 ft) between each segment, and the arrow nearest the intersection shall be approximately 15 m (50 ft) from the intersection. That configuration shall be preceded by one or more similar configurations of arrow-ONLY-arrow, and there shall be a distance of 65 m to 125 m (210 ft to 410 ft) between each such three-segment configuration.

Two three-segment configurations, with 60 m to 120 m (200 ft to 400 ft) between each would place the first arrow 125 m to 250 m (410 ft to 810 ft) from the intersection. Three such three-segment configurations shall place the first arrow 210 m to 425 m (690 ft to 1390 ft) from the intersection.

For lane drop, the standard broken lane line shall become a dotted line beginning at the first approach arrow, and shall become a solid line after passing one-half of the distance from that arrow to the intersection (See the illustrations in Figures 3B-21a, and 3B-21b).

Figure 3B-21a. Examples of Lane Drops.



**Figure 3B-21b. Examples of Auxilliary Lane Lines Lane Drop
- Arterial Application**

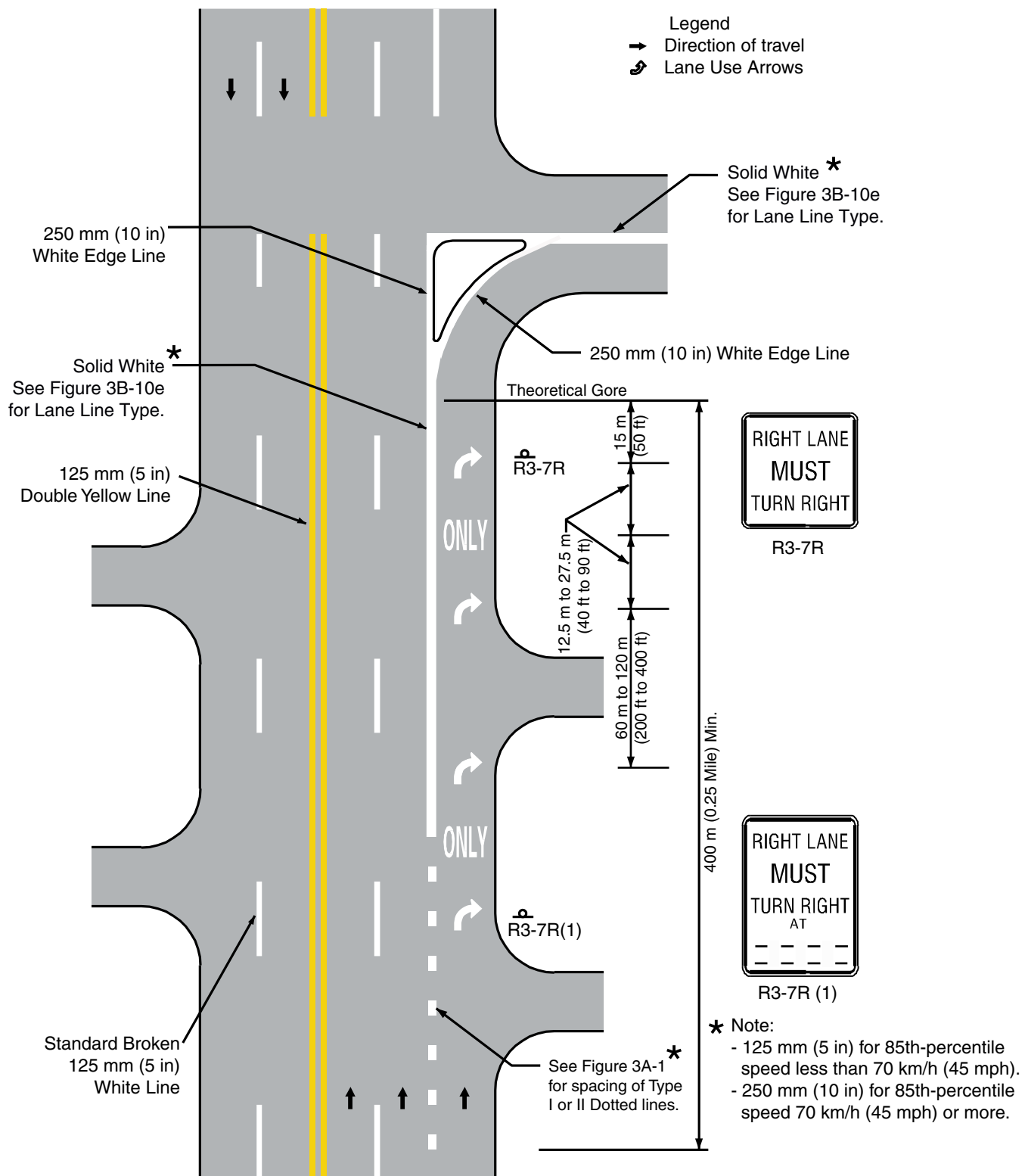


Figure 3B-21c. Examples of Double Turn Lane.

SHA 07/09|

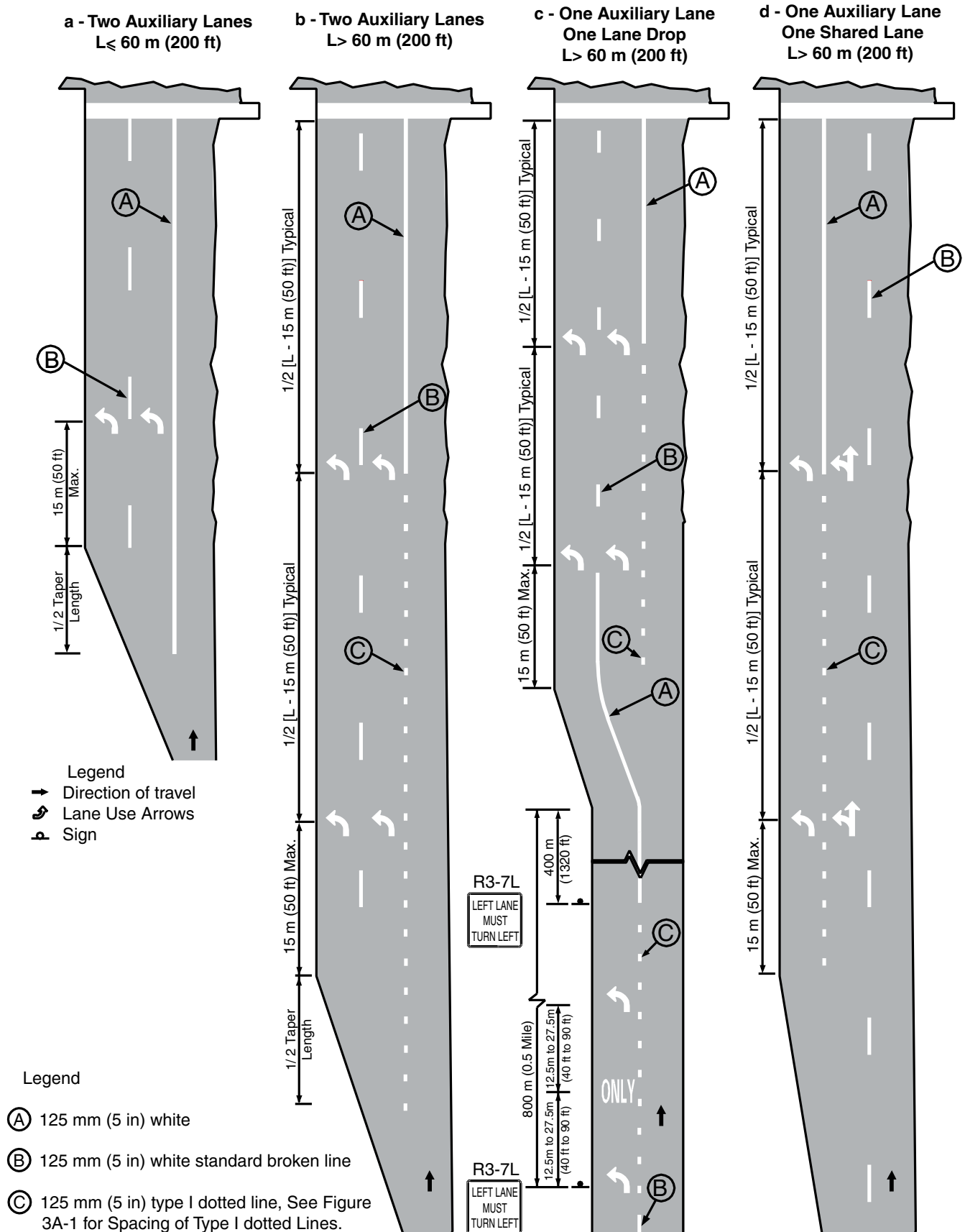


Figure 3B-21d. Examples of Right Turn Bay
- Length of Full Width Turn Lane No Less Than 60 m (200 ft)

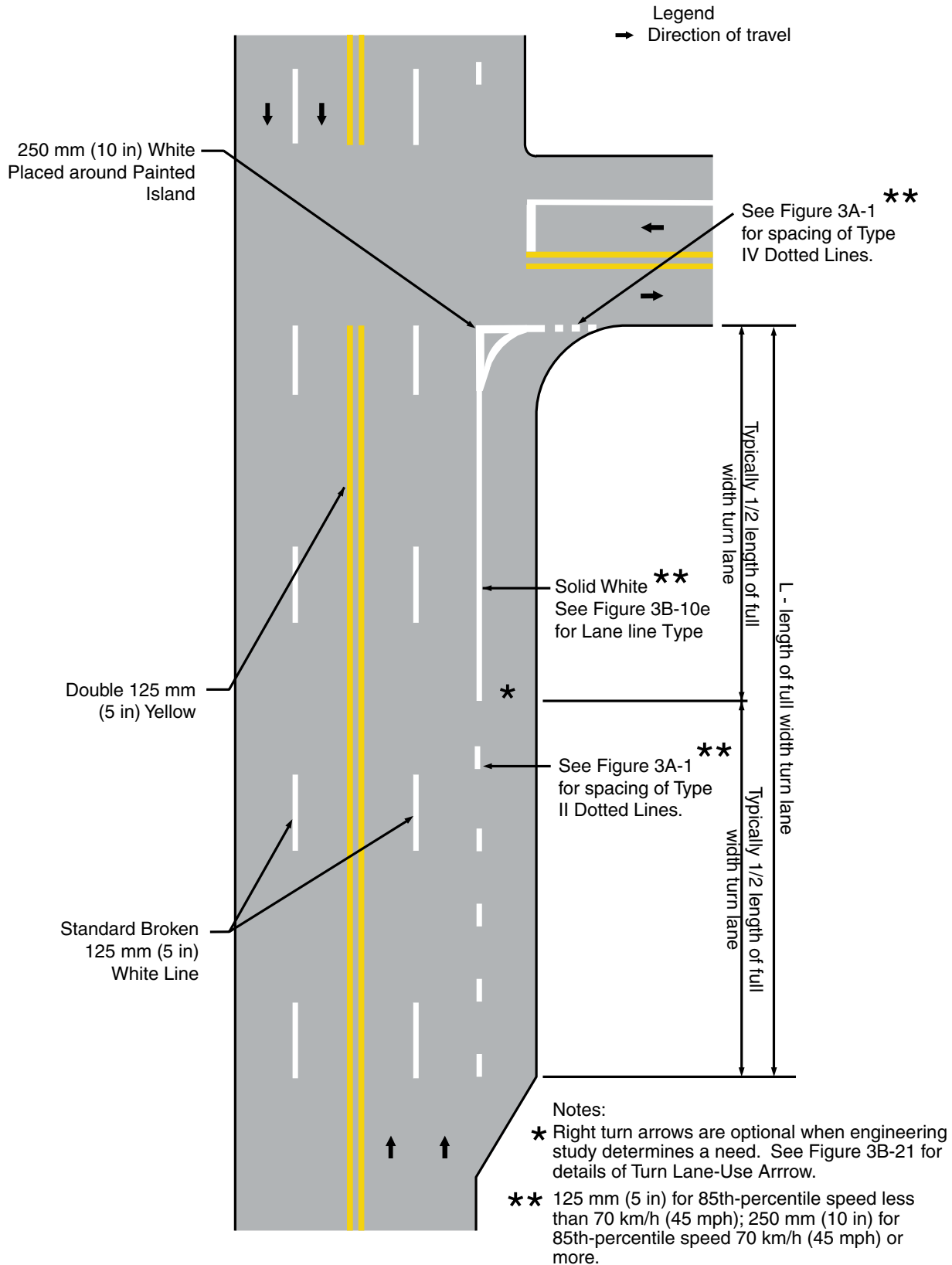


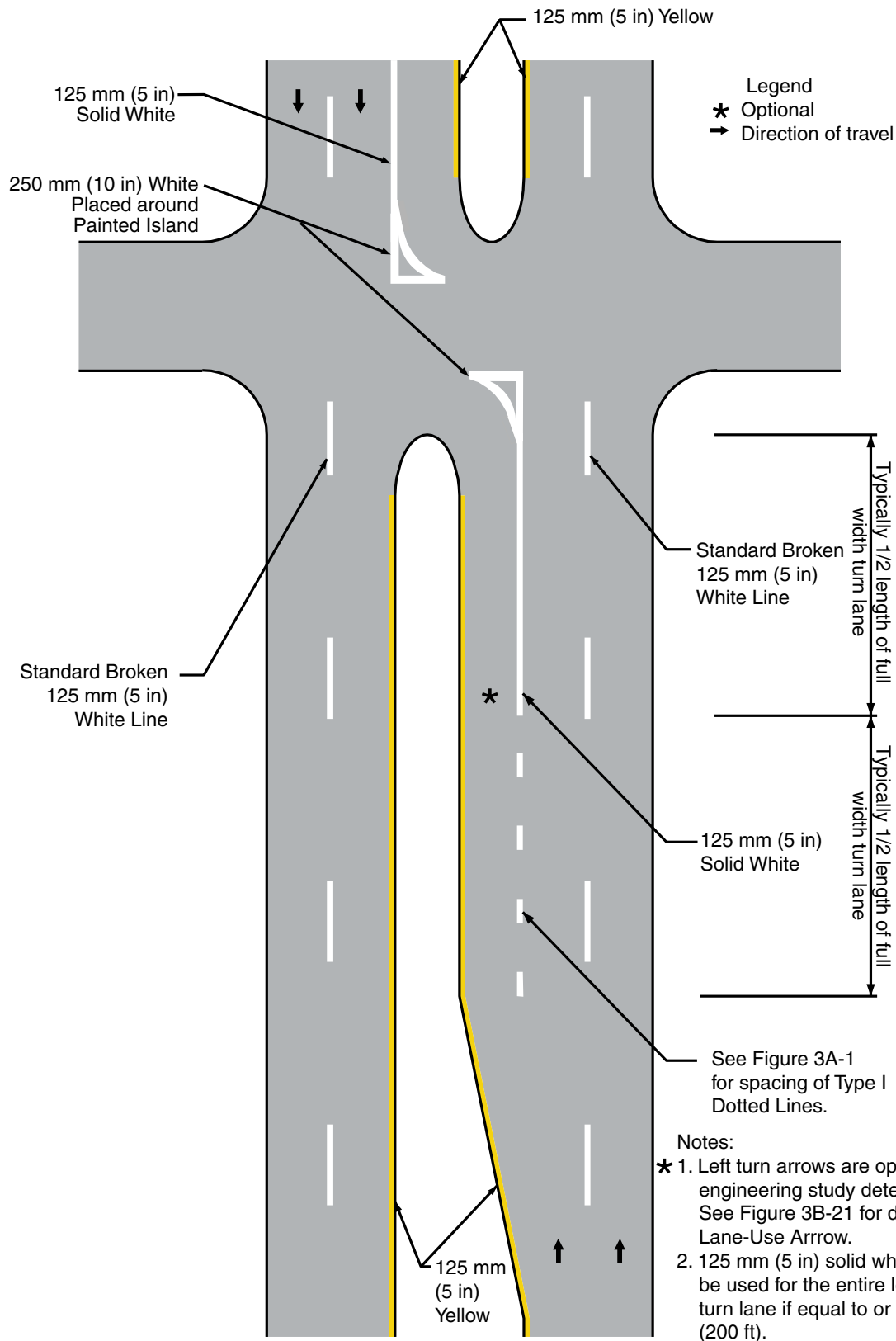
Figure 3B-21e. Examples of Left Turn Bay

Figure 3B-22. Examples of Lane Use Control Word and Symbol Markings

 Not used in Maryland.

Except as otherwise provided for freeways, R3 Series signs shall also be used (See Sections 2B.20 and 2B.21). When ground mounted signs such as the R3-7 or R3-8 are used, the first sign shall be installed at approximately the location of the first approach arrow, and a second sign shall be installed at the last arrow. Intermediate signs also may be used (See Figure 3B-21b). If an intermediate street falls between any such sign and the actual turn, "at street", "at route number", or "at signal" shall be added to the sign message.



Standard:

Double Turn Lanes shall be marked with standard turn arrows. A set of turn arrows shall be placed one-half the length of the turn lane from the intersection.

Guidance:

When mandatory thru lanes are marked, they should be marked consistent with the principles set forth above for lane drops.

Option:

Mandatory through lanes may be marked to discourage illegal turning.

Standard:

Authorizing optional movements beyond what would otherwise be legally available requires the use of arrows with multiple arrowheads. The word "ONLY" shall not be used.

Guidance:

When adjacent to mandatory turn or thru lanes, the arrows should be lined up opposite the arrows in those lanes.

Standard:

The minimum marking configuration for double turn lanes shall be lane-use arrow placed maximum 15 m (50 ft) from the beginning of the full width turn lane when the length of full width turn lane (L) is no more than 60 m (200 ft). A 125 mm (5 in) white solid line shall be placed between the through lane and the turn lane from the intersection to 1/2 of the taper length of the full width turn lane. A standard broken lane line shall be placed between the turn lanes if necessary. 07/09|

When the length of full width turn lane is more than 60 m (200 ft), it is typical to place the second arrow at half of the length from the intersection to the lane-use arrow placed 15 m (50 ft) from the beginning of the full width turn lane (See the illustrations in Figure 3B-21c).

For exclusive double left turns, the standard broken lane line shall become a dotted line at 1/2 of the taper length of the full width turn lane, and shall become a solid line after passing the second lane-use arrow (See Figure 3B-21c). A standard broken lane line shall be placed between the turn lanes.

When a shared lane exists, a standard broken lane line shall be placed between the shared lane and the through lane. The pavement markings between the shared lane and the turn lane typically start with a dotted line from the beginning of full width turn lane and become a solid line after passing one-half of the distance to the intersection from the first lane-use arrow (See Figure 3B-21c).

When a lane-drop is included, see Figures 3B-21c for details.

Guidance:

Special guidelines for turn bays within two-way left turn lane systems are contained in Section 3B.03.

Guidance:

Where crossroad channelization or ramp geometrics do not make wrong-way movements difficult, a lane-use arrow should be placed in each lane of an exit ramp near the crossroad terminal where it will be clearly visible to a potential wrong-way roaduser (see Figures 3B-23 and 3B-23a).

Figure 3B-23. Examples of Arrow Markings at Exit Ramp Terminals

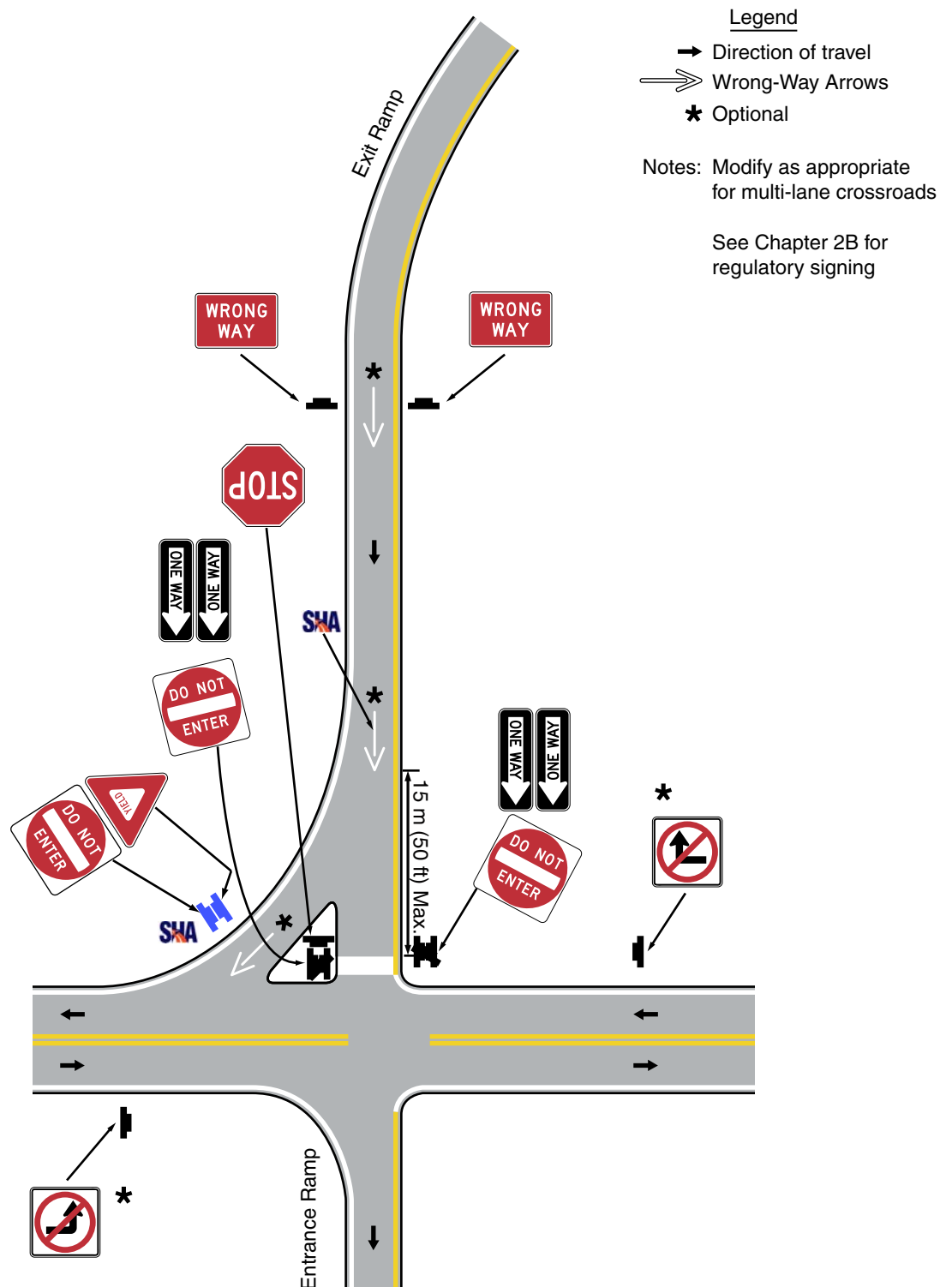


Figure 3B-23a. Examples of Wrong-Way Arrows for Pavement Markings 

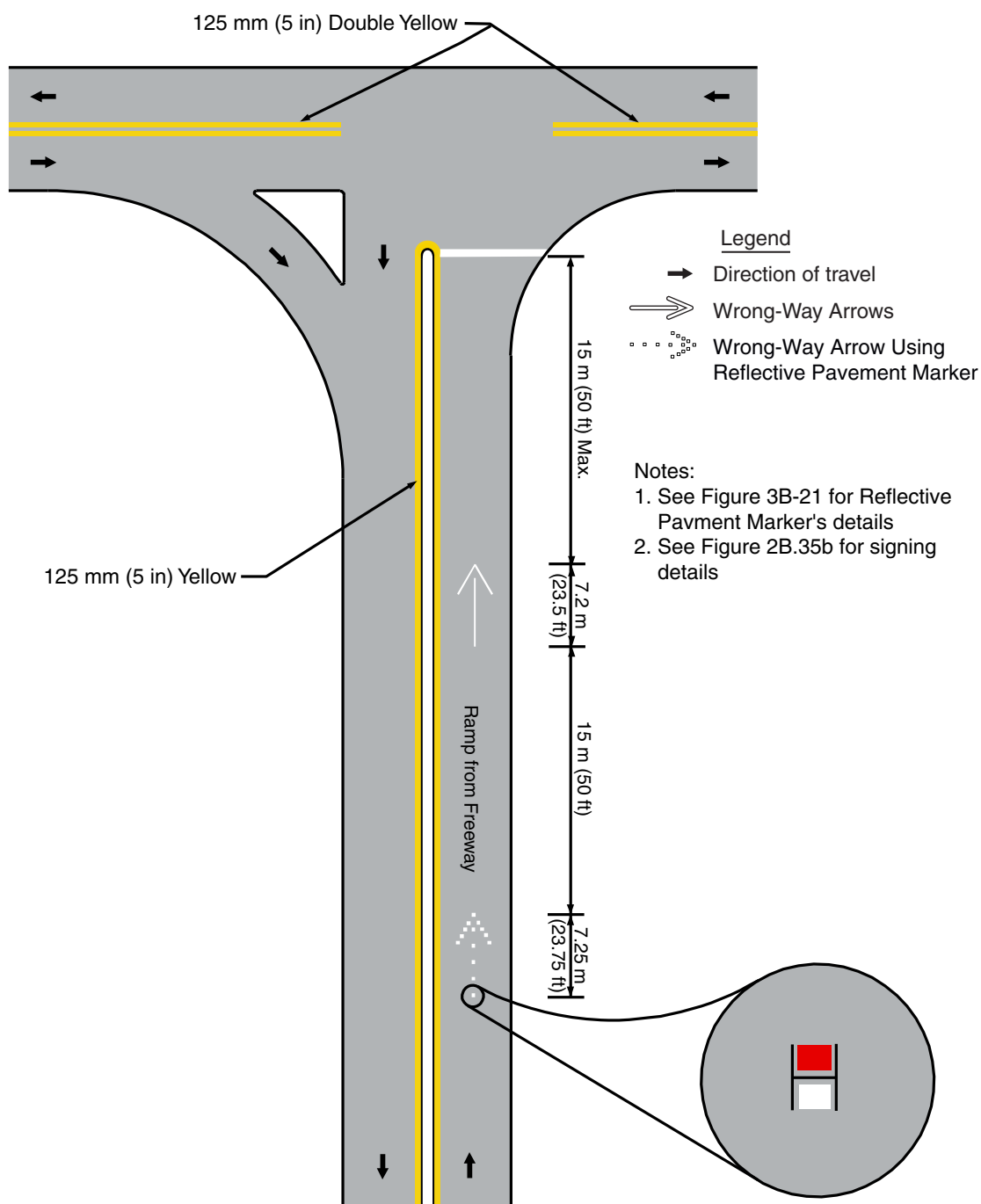


Figure 3B-24. Examples of Arrow Markings at Entrance Ramp Terminals

Not used in Maryland.

SHA

Option:

The wrong-way arrow markings shown in Figure 3B-21 may be placed near the downstream terminus of a ramp as shown in Figures 3B-23 and 3B-23a to indicate the correct direction of traffic flow and to discourage drivers from traveling in the wrong direction.

SHA

A yield-ahead triangle symbol or YIELD AHEAD word pavement marking may be used on approaches to intersections where the approaching traffic will encounter a YIELD sign at the intersection (see Figure 3B-25).

Support:

Lane-use arrow markings are often used to provide guidance in turn bays (see Figure 3B-21c), where turns may or may not be mandatory, and in two-way left-turn lanes (see Figure 3B-7).

SHA

Option:

Word and symbol markings may include, but are not limited to, the following. Other words or symbols may also be used under certain conditions.

A. Regulatory:

1. STOP
2. RIGHT (LEFT) TURN ONLY
3. 40 km/h (25 MPH)
4. Arrow Symbols

B. Warning:

1. STOP AHEAD
2. YIELD AHEAD
3. YIELD AHEAD Triangle Symbol
4. SCHOOL XING
5. SIGNAL AHEAD
6. PED XING
7. SCHOOL
8. R X R
9. HUMP

SHA

C. Guide:

1. US 40
2. STATE 135
3. ROUTE 40
4. INTERSTATE 95

SHA

Standard:

Except at the ends of aisles in parking lots, the word STOP shall not be used on the pavement unless accompanied by a stop line (see Section 3B.16) and STOP sign (see Section B.04). At the ends of aisles in parking lots, the word STOP shall not be used on the pavement unless accompanied by a stopline.

The word STOP shall not be placed on the pavement in advance of a stop line, unless every vehicle is required to stop at all times.

The yield-ahead triangle symbol or YIELD AHEAD word pavement marking shall not be used unless a YIELD sign (see Section 2B.08) is in place at the intersection. The yield-ahead symbol marking shall be as shown in Figure 3B-25.

Section 3B.20 Speed Measurement Markings

Support:

A speed measurement marking is a transverse marking placed on the roadway to assist the enforcement of speed regulations.

Standard:

Speed measurement markings, if used, shall be white, and shall not be greater than 600 mm (24 in) in width. Figure 3B-25a illustrates Speed Measurement Markings.

SHA

Option:

Speed measurement markings may extend 600 mm (24 in) on either side of the centerline or 600 mm (24 in) on either side of edge line markings at 400 m (0.25 mi) intervals over a 1.6 km (1 mi) length of roadway. When paved shoulders of sufficient width area available, the speed measurements markings may be placed entirely on these shoulders. Advisory signs may be used in conjunction with these markings (see Figure 3B-10).

b. Exit Only Lane

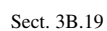


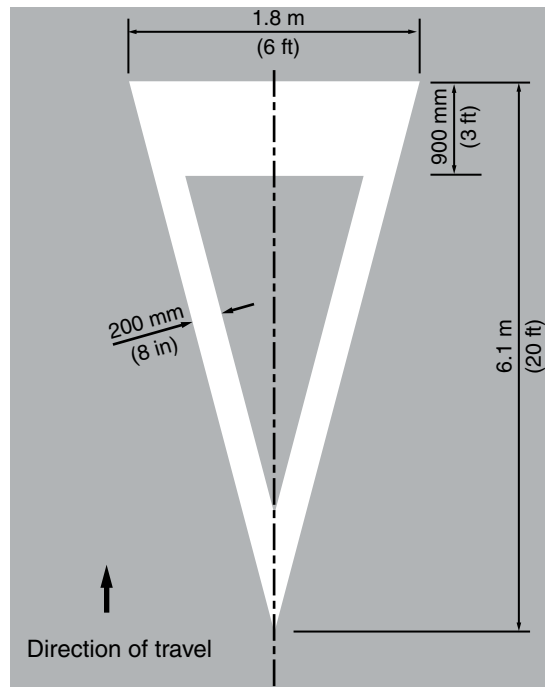
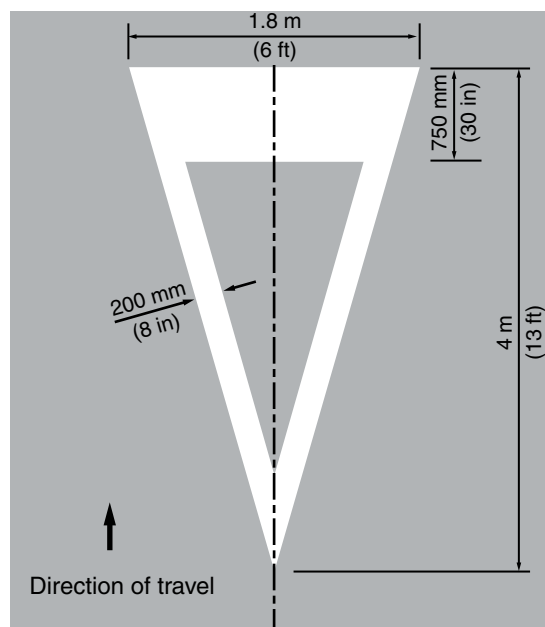
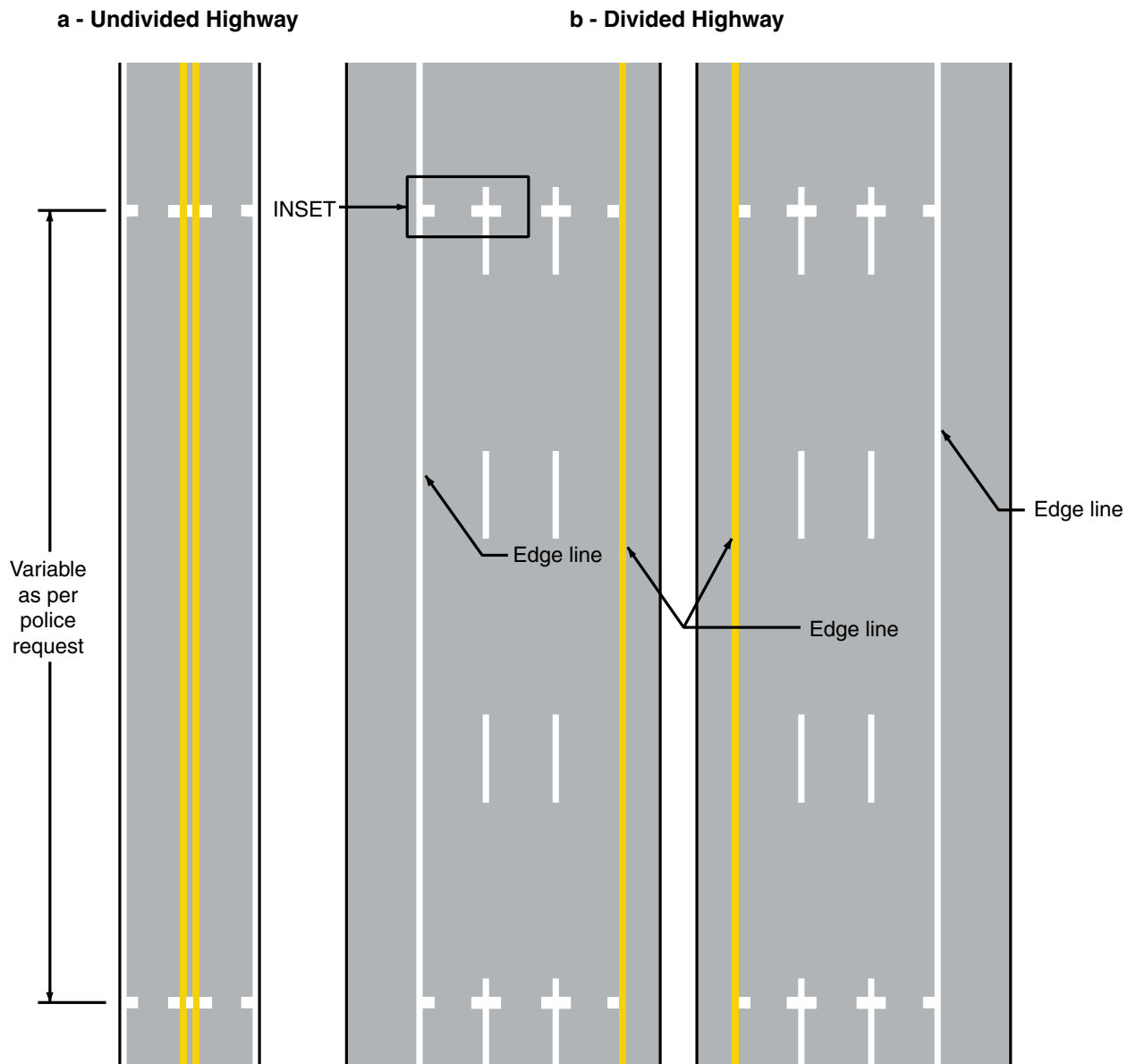
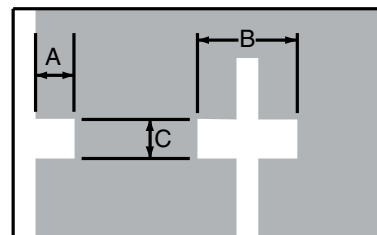
Figure 3B-25. Yield Ahead Triangle Symbols**a - Posted or Statutory Speed Limit 70 km/h (45 mph) or greater****b - Posted or Statutory Speed Limit less than 70 km/h (45 mph)**

Figure 3B-25a. Speed Measurement Markings.

Vascar and aerial speed surveillance markings will be white, 400 mm (16 in) wide transverse markings, extending 600 mm (24 in) on each side of the centerline, and each lane line. Also, extending 600 mm (24 in) inside of each edge line. 600 mm (24 in) wide white transverse markings may be applied if requested by the Maryland State Police.

**INSET**

A = 600 mm (24 in)
 B = 1350 mm (53 in)
 C = 400 mm (16 in) std.
 600 mm (24 in) max.

Section 3B.21 Curb Markings

Support:

Curb markings are most often used to indicate parking regulations or to delineate the curb.

Standard:

Signs shall be used with curb markings in those areas where curb markings are frequently obliterated by snow and ice accumulation unless the no parking zone is controlled by statute or local ordinance.

Where curbs are marked, the colors shall conform to the general principles of markings (see Section 3A.04).

Guidance:

Except as noted in the Option, when curb markings are used without signs to convey parking regulations, a legible word marking regarding the regulation (such as “No Parking” or “No Standing”) should be placed on the curb.

Option:

Curb markings without word markings or signs may be used to convey a general prohibition by statute of parking within a specified distance of a STOP sign, driveway, fire hydrant, or crosswalk.

Guidance:

Retroreflective solid yellow markings should be placed on the noses of raised medians and curbs of islands that are located in the line of traffic flow where the curb serves to channel traffic to the right of the obstruction.

Retroreflective solid white markings should be used when traffic may pass on either side of the island.

Option:

Local highway agencies may prescribe special colors for curb markings to supplement standard signs for parking regulation.

Support:

Since yellow and white curb markings are frequently used for curb delineation and visibility, it is advisable to establish parking regulations through the installation of standard signs (see Sections 2B.39 through 2B.41).

Where the curbs of the islands become parallel to the direction of traffic flow, it is not necessary to mark the curbs unless an engineering study indicates the need for this type of delineation.

Curbs at openings in a continuous median island need not be marked unless an engineering study indicates the need for this type of marking.

Section 3B.22 Preferential Lane Word and Symbol Markings

Standard:

When a lane is assigned full or part time to a particular class or classes of vehicles, preferential lane markings shall be used.

Signs or signals shall be used with preferential lane word or symbol markings.

All preferential lane word and symbol markings shall be white.

All preferential lane word and symbol markings shall be positioned laterally in the center of the preferred-use lane.

Support:

Preferential lanes identify a wide variety of special uses, including, but not limited to, high-occupancy vehicle (HOV) lanes, bicycle lanes, bus only lanes, taxi only lanes, and light rail transit only.

Standard:

Where a preferential lane use is established, the preferential lane shall be marked with one or more of the following symbol or word markings for the preferential lane use specified:

- A. HOV lane**—the preferential lane use marking for high-occupancy vehicle lanes shall consist of white lines formed in a diamond shape symbol or the word message HOV. The diamond shall be at least 0.75 m (2.5 ft) wide and 3.7 m (12 ft) in length. The lines shall be at least 150 mm (6 in) in width.
- B. Bicycle lane**—the preferential lane use marking for a bicycle lane shall consist of a bicycle symbol or the word marking BIKE LANE (see Chapter 9C and Figures 9C-1 and 9C-3 through 9C-6).
- C. Bus only lane**—the preferential lane use marking for a bus only lane shall consist of the word marking BUS ONLY.

- D. Taxi only lane**—the preferential lane use marking for a taxi only lane shall consist of the word marking TAXI ONLY.
- E. Light rail transit lane**—the preferential lane use marking for a light rail transit lane shall consist of the letter T.
- F. Other preferential lane use markings** shall be identified in accordance with Section 3B.23.

If two or more preferential lane uses are permitted in a single lane, the symbol or word marking for each preferential lane use shall be installed.

Guidance:

Engineering judgment should determine the need for supplemental devices such as tubular markers, traffic cones, or flashing lights.

Support:

The spacing of the markings is an engineering judgment that is based on the prevailing speed, block lengths, distance from intersections, and other factors that affect clear communication to the road user. Markings spaced as close as 24 m (80 ft) apart might be appropriate on City streets, while markings spaced 300 m (1,000 ft) might be appropriate for freeways.

Option:

The vehicle occupancy requirements established for a high-occupancy vehicle lane may be included in sequence after the diamonds symbol or HOV word message.

Section 3B.23 Preferential Lane Longitudinal Markings for Motor Vehicles

Standard:

Preferential lane longitudinal markings for motor vehicles shall be marked with the appropriate word or symbol pavement markings in accordance with Section 3B.22.

Support:

Preferential lanes can take many forms depending on the level of usage and the design of the facility. They might be physically separated from the other travel lanes by a barrier, median, or painted neutral area, or they might be concurrent with other travel lanes and be separated only by longitudinal pavement markings. Further, physically separated preferential lanes might operate in the same direction or be reversible.

Option:

Preferential lanes may be operated either full-time (24 hours per day on all days), for extended periods of the day, or part-time (restricted usage during specific hours on specified days).

Standard:

The following four items are presented in tabular form in Table 3B-2:

- A. Physically separated, nonreversible preferential lane**—the longitudinal pavement markings for preferential lanes that are physically separated from the other travel lanes by a barrier, median, or painted neutral area shall consist of a single normal solid yellow line at the left edge of the travel lane(s), a single normal solid white line at the right edge of the travel lane(s), and if there are two or more preferential lanes, the preferential travel lanes shall be separated with a normal broken white line (see Figure 3B-26a).
- B. Physically separated, reversible preferential lane**—the longitudinal pavement markings for reversible preferential lanes that are physically separated from the other travel lanes by a barrier, median, or painted neutral area shall consist of a single normal solid white line at both edges of the travel lane(s), and if there are two or more preferential lanes, the preferential travel lanes shall be separated with a normal broken white line (see Figure 3B-26a).
- C. Concurrent flow (left side) preferential lane**—the longitudinal pavement markings for a full-time or part-time preferential lane on the left side of the other traveled lanes shall consist of a single normal solid yellow line at the left edge of the preferential travel lane(s) and one of the following at the right edge of the preferential travel lane(s):
 - 1. A double solid wide white line where crossing is prohibited (see Figure 3B-26b).
 - 2. Not used in Maryland.
 - 3. A single broken wide white line where crossing is permitted (see Figure 3B-26d).

If there are two or more preferential lanes, the preferential travel lanes shall be separated with a normal broken white line.

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Table 3B-2. Standard Edge Line Lane Markings for Preferential Lanes 

Type of Preferential Lane	Left Edge Line	Right Edge Line
Physically Separated, Nonreversible	A single normal solid yellow line	A single normal solid white line
Physically Separated, Reversible	A single normal solid white line	A single normal solid white line
Concurrent Flow—Left Side	A single normal solid yellow line	<p>A double solid wide white line where crossing is prohibited (see Figure 3B-26b)</p> <p>A single broken wide white line where crossing is permitted (see Figure 3B-26d)</p>
Concurrent Flow—Right Side	<p>A double solid wide white line where crossing is prohibited (see Figure 3B-26e)</p> <p>A single solid wide white line where crossing is discouraged (see Figure 3B-26e)</p> <p>A single broken wide white line where crossing is permitted (see Figure 3B-26e)</p> <p>A single dotted normal white line where crossing is permitted for any vehicle to perform a right-turn maneuver (see Figure 3B-26e)</p>	A single normal solid white line

Notes: If there are two or more preferential lanes, they shall be separated with a normal broken white line.

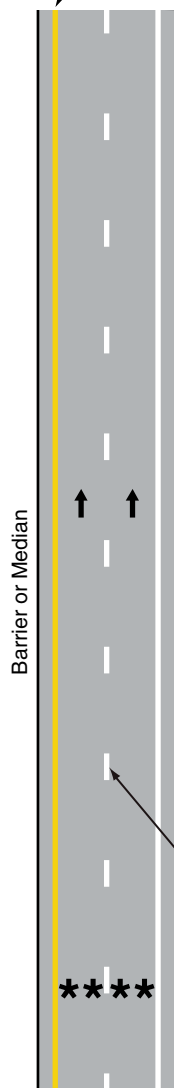
The standard lane markings listed in this table are provided in a tabular format for reference.

This information is also described in the second Standard in Section 3B.23.

Figure 3B-26. Examples of Markings for Preferential Lanes
(Sheet 1 of 2)

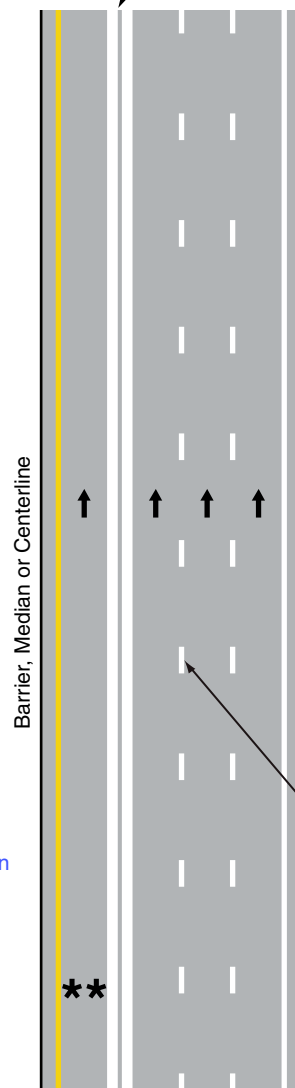
a - Physically separated permanent lane(s)

YELLOW
(OR WHITE IF
REVERSIBLE)



b - Full-time concurrent lane(s) where enter/exit movements are PROHIBITED

DOUBLE SOLID
WIDE WHITE



c - Concurrent lane(s) where enter/exit movements are DISCOURAGED

Not used in Maryland.



Legend

→ Direction of travel

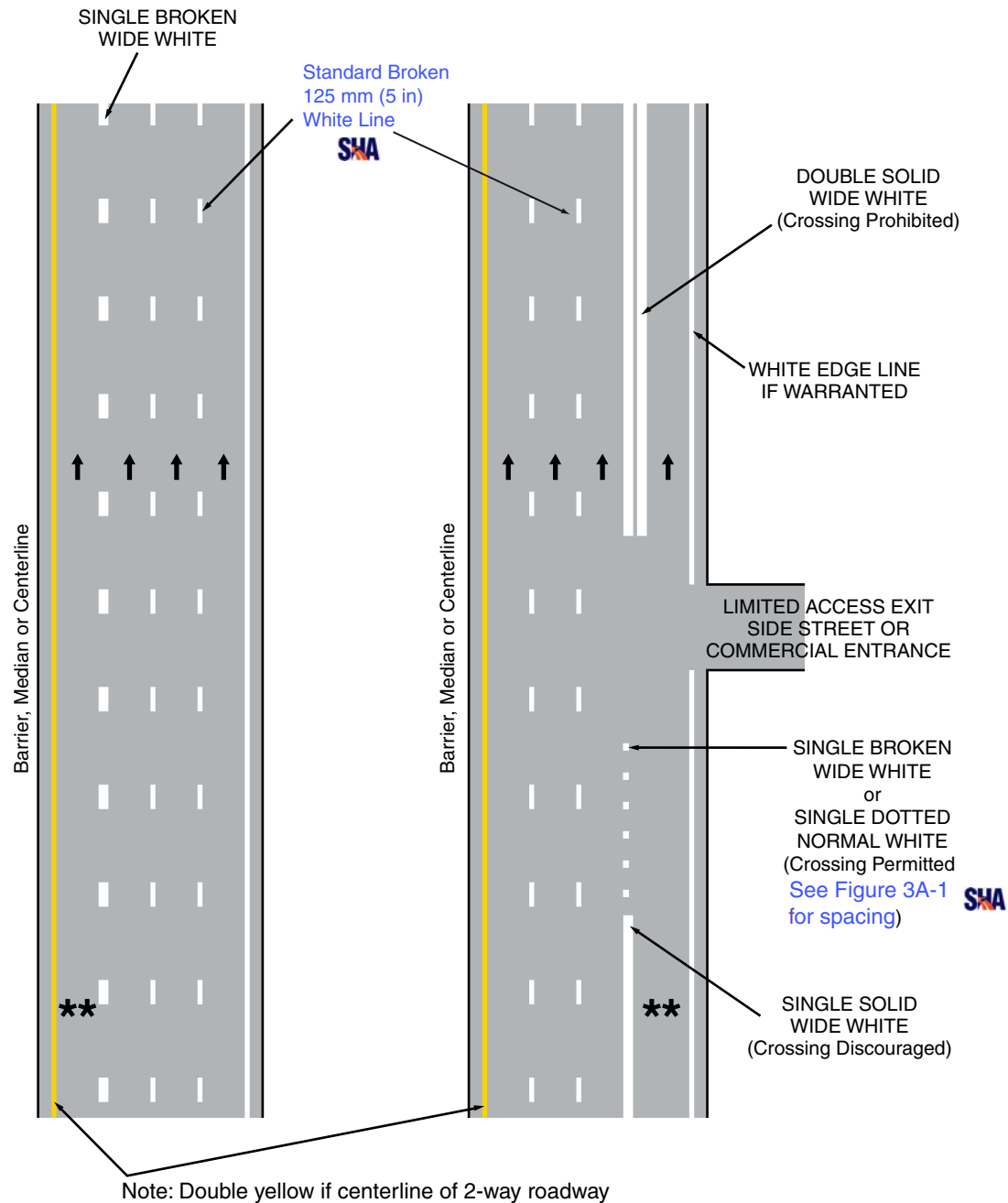
*** Applicable symbol or word

Note: Double 125 mm (5 in) yellow if centerline of 2-way roadway

Figure 3B-26. Examples of Markings for Preferential Lanes
(Sheet 2 of 2)

**d - Full-time concurrent lane(s)
where enter/exit movements
are PERMITTED**

e - Right Side Concurrent Lane(s)



Legend

- Direction of travel
- ** Applicable symbol or word

D. Concurrent flow (right side) preferential lane—the longitudinal pavement markings for a full-time or part-time preferential lane on the right of the other travel lanes shall consist of a single normal solid white line at the right edge of the preferential travel lane(s) if warranted and one of the following at the left edge of the preferential travel lane(s):

1. A double solid wide white line where crossing is prohibited (see Figure 3B-26b).
2. [Not used in Maryland.](#)
3. A single broken wide white line where crossing is permitted (see Figure 3B-26d).
4. A single dotted normal white line where crossing is permitted for any vehicle to perform a right turn maneuver (see Figure 3B-26e).



If there are two or more preferential lanes, the preferential travel lanes shall be separated with a normal broken white line.

Guidance:

When concurrent flow preferential lanes and other travel lanes are separated by more than 1.2m (4 ft), chevron markings should be placed in the neutral area. The chevron spacing should be 30 m (100 ft) or greater.

Option:

For full-time or part-time concurrent flow preferential lanes, the spacing or skip pattern of the single broken wide white line may be reduced. The width of the single broken wide white line may be increased.

Section 3B.24 Markings for Roundabout Intersections

Support:

Roundabout intersections are distinctive circular roadways that have the following three critical characteristics:

- A. A requirement to yield at entry which gives a vehicle on the circular roadway the right-of-way;
- B. A deflection of the approaching vehicle around the central island; and
- C. A flare or widening of the approach to allow for proper operation as needed.

Examples of markings for roundabout intersections are shown in Figures 3B-27 and 3B-28.

Option:

A yellow edge line may be placed around the inner (left) edge of the circular roadway.

Guidance:

A white line should be used on the outer (right) side of the circular roadway as follows: a solid line along the splitter island and a dotted line across the lane(s) entering the roundabout intersection.

Edge line extensions should not be placed across the exits from the circular roadway.

Where crosswalk markings are used, these markings should be located a minimum of 7.6 m (25 ft) upstream from the yield line, or, if none, from the dotted white line.

[Lane lines should be used on certain sections of the circular roadway and certain intersecting roadways if there is more than one lane.](#)



Option:

A yield line (see Section 3B.16) may be used to indicate the point behind which vehicles are required to yield at the entrance to a roundabout intersection.

Standard:

Bicycle lane markings shall not be provided on the circular roadway of a roundabout intersection.



Support:

[The “Roundabout Traffic Design Guideline” contains further information regarding markings for roundabout intersections. This document can be obtained from the Maryland State Highway Administration’s Office of Traffic & Safety, Traffic Development & Support Division \(TDSD\) at the address shown on Page i.](#)

Section 3B.25 Markings for Other Circular Intersections

Support:

Other circular intersections include but are not limited to rotaries, traffic circles, and residential traffic calming designs.

Option:

The markings shown in Figures 3B-27 and 3B-28 may be used at other circular intersections when engineering judgment indicates that their presence will benefit drivers or pedestrians.

Section 3B.26 Speed Hump Markings

Standard:

If used, speed hump markings shall be a series of white markings placed on a speed hump to identify its location.

Option:

Speed humps, except those used for crosswalks, may be marked in accordance with Figure 3B-29. The markings shown in Figure 3B-30 may be used where the speed hump also functions as a crosswalk or speed table.

Section 3B.27 Advance Speed Hump Markings

Standard:

If used, advance speed hump markings shall be a special white marking placed in advance of speed humps or other engineered vertical roadway deflections such as dips.

Option:

Advance speed hump markings may be used in advance of an engineered vertical roadway deflection where added visibility is desired or where such deflection is not expected (see Figure 3B-31).

Advance pavement wording such as HUMP (see Section 3B.19) may be used on the approach to a speed hump either alone or in conjunction with advance speed hump markings. Appropriate advance warning signs may be used in conformance with Section 2C.24.

Guidance:

If used, advance speed hump markings should be installed in each approach lane.

Figure 3B-27. Examples of Markings for Roundabout Intersections with One-Lane Approaches

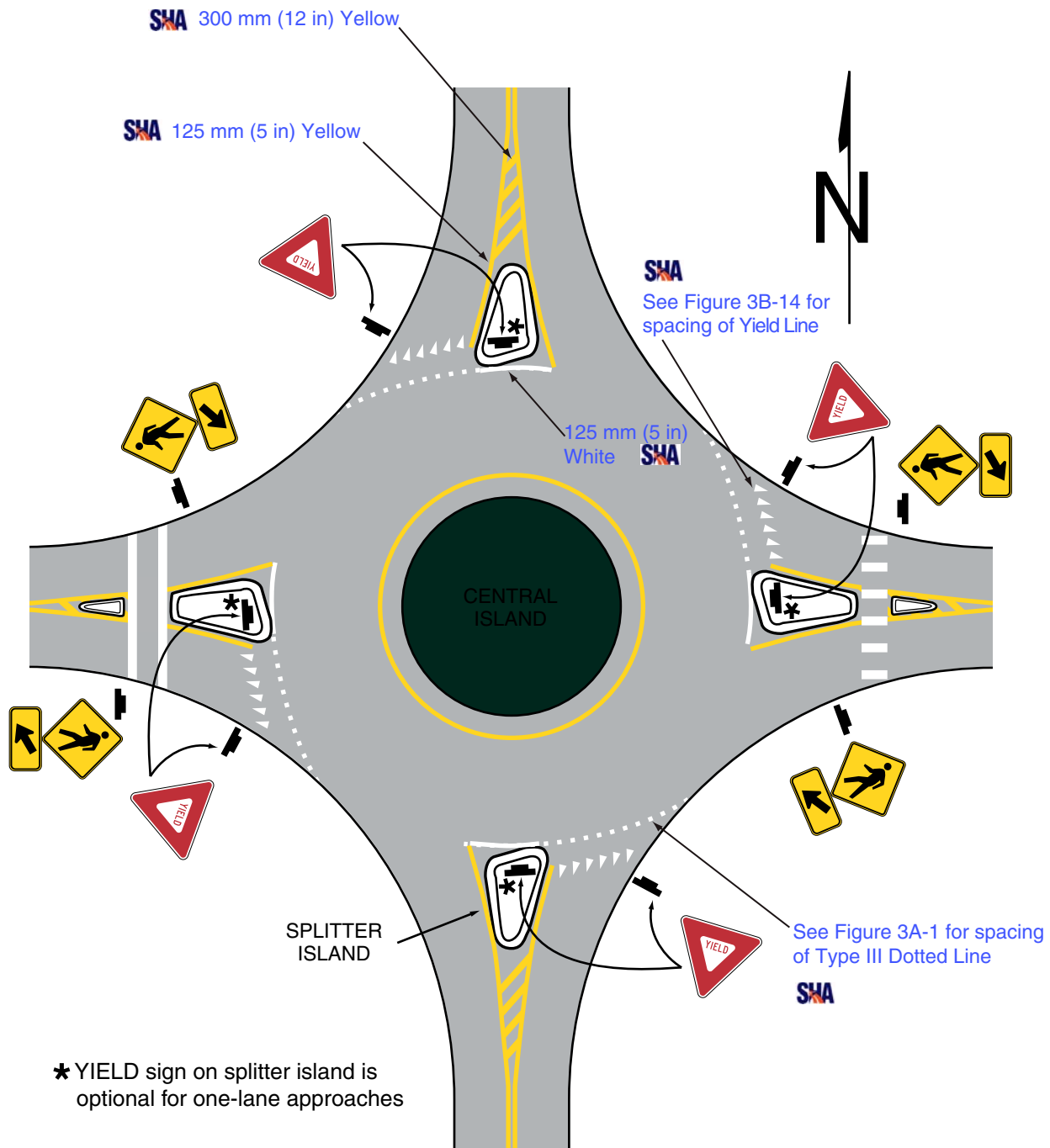


Figure 3B-28. Examples of Markings for Roundabout Intersections with Two-Lane Approaches

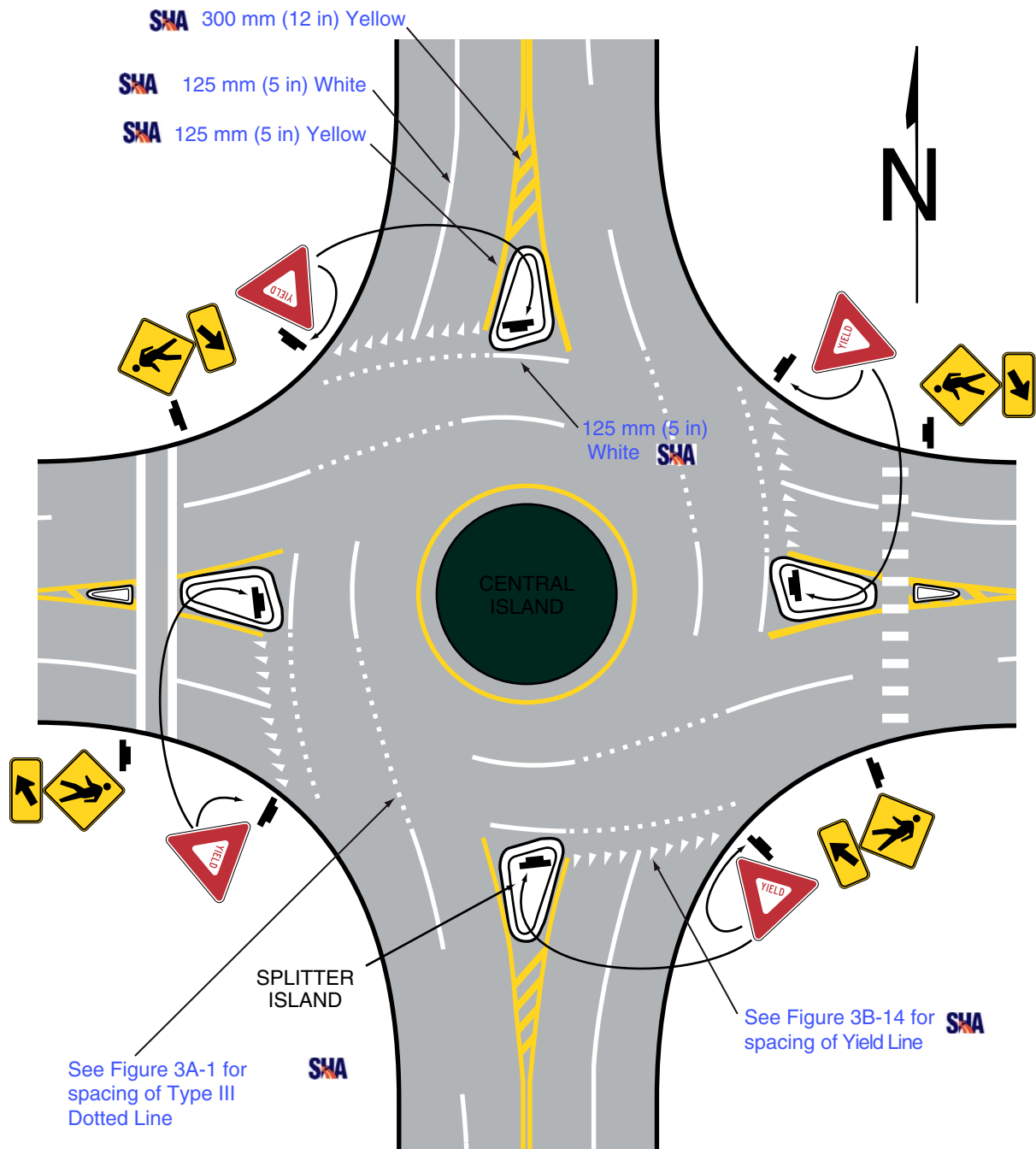


Figure 3B-29. Examples of Pavement Markings for Speed Humps Without Crosswalks

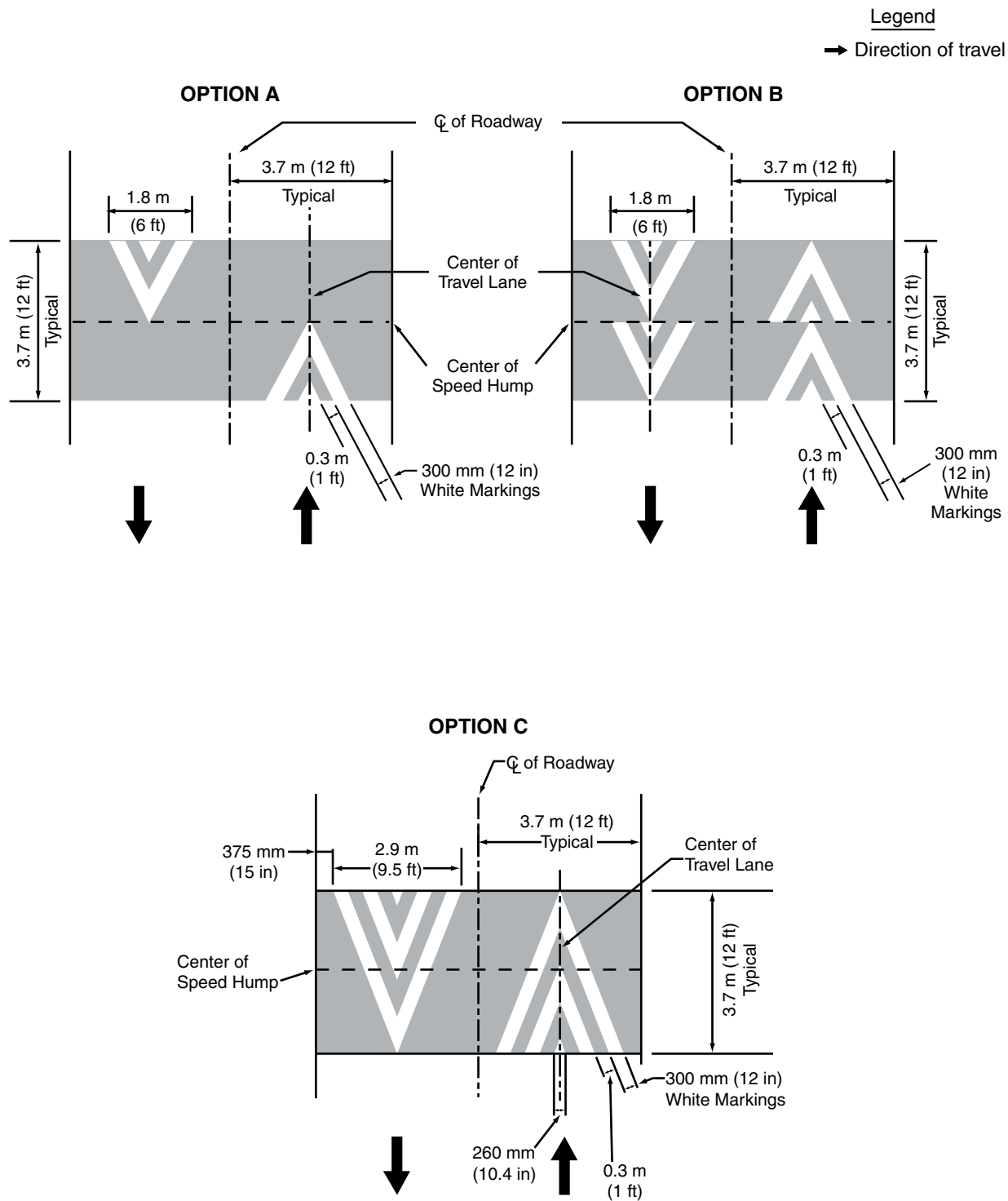


Figure 3B-30. Examples of Pavement Markings for Speed Tables or Speed Humps with Crosswalks

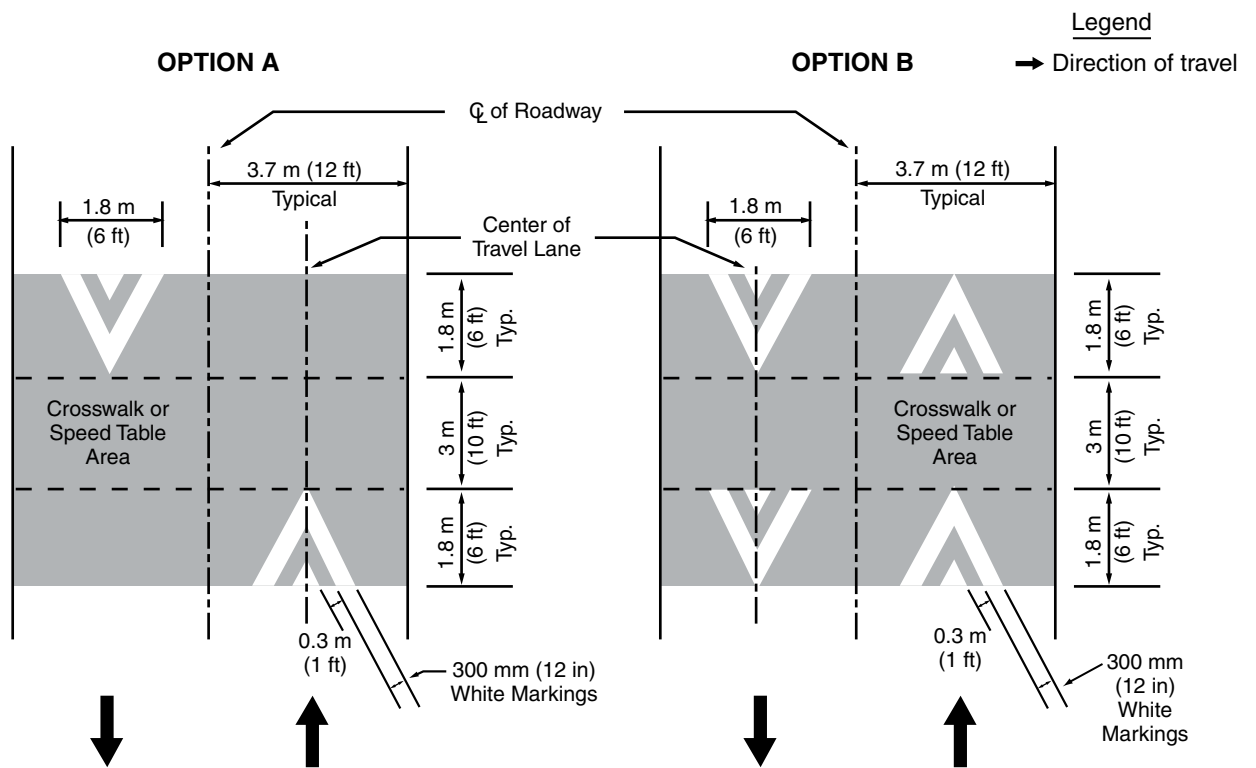


Figure 3B-31. Examples of Advance Warning Markings for Speed Humps